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VOL. II.—6TH YEAR.

SYDNEY: SATURDAY, SEPTEMBER 27, 1919.

No. 13.

THE CAUSE AND PREVENTION OF DENTAL CARIES.¹

By G. E. Clemons, M.D., C.M. (Edin.),
Launceston, Tasmania.

Frequent complaints are made in medical literature, especially of later years, of a want of collaboration between laboratory workers and the clinician and general practitioner. Valuable facts are ascertained by the laboratory workers, but the majority remain unknown to the general practitioner and are heard little more of and made little use of. Moreover, the scientific facts evolved from animal experiments in the laboratory have to be tried on the human subject before they can be made of practical use and chemical experiments *in vitro* are not always successful *in vivo*.

Certain laboratory experiments to which I shall presently refer in detail, have been published. These experiments seem to me to be not only eminently worthy of our notice, but also quite capable of being tested in our own practices and if the results are found to support the laboratory findings, they should prove the greatest value to our patients.

The subject of the cause and prevention of dental caries is one which has occupied the serious attention of many workers, both medical and dental. Indeed, there seems to have been some mutual recrimination between the two professions. One recent medical writer concluded an article by asking the dentists to wake up and become something more than skilled mechanics; the dentists, meanwhile, asserted that the matter of cause and prevention was outside their province. Personally, I think it is our business, as I hope it will be our privilege, to make a solution of what has been an elusive problem.

Perhaps the best known work on the subject is that of Dr. J. Sim Wallace, who comes to the conclusion that the main cause of decay in teeth is the sort of pappy foods on which children and adolescents are fed; and that they should thoroughly masticate food of a hard and fibrous nature.

Dr. Pickerill, Professor of Dentistry in the University of Otago, has written an essay which obtained the Cartwright prize at the Royal College of Surgeons, 1910, on the prevention of dental caries and oral sepsis. He lays most stress on the eating of fruits and sapid substances generally, which not only cleanse the teeth mechanically, but also promote a flow of saliva sufficient to wash away all the debris of other food substances.

These and other writers on the subject discuss in the main, the type of food according to its hardness and softness, the consequent improvement in the circulation and development of the jaws and teeth and their effect in the production of acids and toxins by bacterial decomposition.

Now, I do not wish to underrate these factors, some of which must undoubtedly have an influence, for who can doubt but that the increased blood supply, determined to the muscles of mastication by thoroughly chewing hard food, will also favourably

affect the blood supply to the jaws and teeth, nor can anyone doubt the cleansing effect, say of eating an apple? Yet they have overlooked or have not had an opportunity of observing what I consider a more important fact, *viz.*, that not unfrequently infant's teeth when, and as soon as they erupt, show signs of malnutrition. I have repeatedly seen in children whose parents were free from syphilis or other obvious constitutional disorder, the first incisors, as well as other teeth, quite brown and soft, ill-formed and deficient in enamel, and sometimes even before they were weaned. These deciduous teeth were formed in embryo and during the first months of infant life and, obviously, the malnutrition is due to some defect in the mother's blood or the mother's milk, or both. What is the defect? That is the problem which, I believe, will be found to have been solved by the laboratory experiments I have referred to. Before going into them in detail, pardon me if I unnecessarily refresh your minds on a question of chemical physiology, and quote Dr. Halliburton (page 82, 8th edition, 1914).

If an animal is fed on a mixture of pure protein, fat, carbohydrates, with a due admixture of mineral salts and water, it does not thrive, but shows evidence of malnutrition, although the quantities given may be theoretically correct. If a growing animal be fed on such a diet, it ceases to grow. But, if a small amount of a natural food, such as milk, is mixed with the artificial diet referred to the animals thrive and grow normally.

If this unknown constituent to which the name of vitamine is given, is absent from a man's diet, he undergoes the same sort of malady, and diseases are produced termed scurvy, pellagra, rickets, and, I venture to suggest, hypoplasia of the teeth belong to this category, but the best known and most thoroughly investigated is beri beri.

Dr. Hopkins, Professor of Bio-Chemistry in the University of Cambridge, in a recent article stated that in certain rice-eating communities in the East, notably Japan, the Malay Peninsula and the Dutch East Indies, where rice is the staple food, beri beri (a peripheral neuritis) is endemic. More recently Mr. Carridge has controverted this, *i.e.*, the peripheral neuritic nature of it, but this does not affect the main argument. The natural grain contains a special constituent necessary to the body; over-milling removes this; polished rice is a deficient food. The proof of this is due to the Dutch physician, Eijkmann. His statistics dealt with 279,621 individuals. In 37 prisons unpolished rice was employed; only one of these 37 developed cases of beri beri. In 13 prisons polished rice was used mixed with unpolished; in six of them beri beri developed. Out of 51 prisons, where polished rice was exclusively used, cases of beri beri developed in 70%.

For each 10,000 of the prison population, there was only one case amongst those eating unpolished rice; there were 416 on mixed rice and 3,900 on polished rice.

Experiments have shown that pigeons fed on polished rice develop the same disease, which can be quickly cured by the addition of the polishings of

¹ Read at a Meeting of the Tasmanian Branch of the British Medical Association on July 15, 1919.

rice, or of other food stuffs containing vitamins. Now, are these vitamins purely theoretical substances? Their existence has been affirmed, later denied and later reaffirmed. Their nature is at present unknown. Dr. Hopkins says they can be extracted, precipitated, redissolved, but not completely separated from other substances. There are at least two, probably three, of them, one is soluble in certain fats, the other in water. They are both present in lean meat, wheat embryo, wheat, bran, egg yolk, milk, cabbage, potato and yeast. The fat soluble one is present in butter, but not in vegetable fats. Cod liver oil is especially rich in the fat soluble vitamin.

Now I come, I hope before I have taxed your patience too much, to the laboratory experiments I have referred to.

Dr. Ed. Mellanby in the *Journal of Physiology* (January, 1918) details the results of experiments on puppies in the course of an extensive research on rickets for the Medical Research Committee, and the teeth of the same puppies were made the subject of experimental research by his wife.

Puppies of the same litter were fed on diets consisting of white bread and separated milk and the articles to be experimented on.

In one case 0.6 grm. of cod liver oil *per diem* was added, in a second 0.6 grm. of butter and in a third 0.6 grm. of linseed oil.

While the teeth and jaws of these puppies were being examined special attention was paid to the following points:—

- (1) The time of shedding of the deciduous teeth.
- (2) The time of eruption of permanent teeth.
- (3) The arrangement of the teeth in the jaws.
- (4) The condition of the enamel.
- (5) The calcium content.

The result of the observations showed that in the first case the puppy: (1) after 15 weeks had lost all its deciduous teeth; (2) permanent teeth were developed and healthy; (3) the arrangement of the teeth was normal; (4) the enamel was perfect; and (5) the calcium content was greater than in the other puppies.

In the second experiment, in which butter was added to the diet, it was ascertained that: (1) some deciduous teeth were still in the jaw; (2) the permanent teeth were not all erupted; and (3) the enamel was not perfect.

In the third experiment, in which linseed oil was added, the teeth were still further behind, the enamel of the incisors near the neck was brown and that of the molars dull brown and poorly calcified. They could be cut with a scalpel.

We must admit that these experiments are most interesting and important and, as far as puppies are concerned, conclusive. Inasmuch as at least 85% of our children suffer from decayed teeth, they vitally concern us and I contend that it is for the general practitioner to prove their applicability or otherwise in the human system. The whole subject of accessory food factors and vitamins is in its infancy. We require much more specific information about the relative value of various kinds of foods with regard to their vitamin content, but we have already sufficient information to enable us to supplement chil-

dren and mother's diets with these necessary factors. In order to supply her offspring after the first period of her pregnancy, the mother must have an adequate supply of them both during gestation and lactation. They should be added to the infant's diet, particularly when the baby is artificially fed. Growing children should have them. I have already mentioned some substances which are known to contain them, plenty of good milk and, for choice unscalded (if the supply is above suspicion), meat, malt, yeast (in the form of tablets, if necessary), cod liver oil; less of white bread, potatoes and other starchy foods deprived by manufacture of their vitamins. The combination of malt and oil for growing children suggests itself and I know of children who have taken this for other purposes and have remarkably good teeth. A child's diet is most likely to be deficient in fat soluble vitamins from infancy to its second year, particularly bottle-fed babies, who are given cow's milk diluted and rarely compensate for by the addition of cream.

Dr. Pickerill in his book finds that Maoris and Esquimaux have by far the best teeth of all the humans. He explains this by the fact that they all eat largely of raw fruit and berries, but in giving a list of their dietaries, he states that Maoris eat largely of meat and mutton birds, both of which substances probably contained fat soluble vitamin. The diet of the Esquimaux which he gives, is largely composed of fats, probably containing the same substance.

FRACTURE OF LOWER END OF HUMERUS.

By A. Jeffreys Wood, M.D.,

Honorary Surgeon, Children's Hospital, Melbourne.

The natural forces at work in the human body to effect repair after injury are sometimes forgotten. Ollier, in 1867, demonstrated by work on animals that when an epiphysis was forcibly detached from the diaphysis of a long bone, the periosteum and part of the soft lower end of the diaphysis were carried away with the epiphysis and that the broken end of the diaphysis pierced the periosteum like a button going through a button hole, and lay bare amongst the muscles. He further demonstrated that new bone was formed in the sleeve of periosteum separated from the bone and that the bone projecting through and uncovered by periosteum was eventually absorbed.

The following case illustrates the early formation of the new bone in the sleeve of periosteum and also shows an unexpectedly good result following on expectancy rather than on surgical interference:—

R.S., *et.* 6 years, male, was admitted to the Children's Hospital, Melbourne, on December 17, 1915, with the history that he had fallen from his pony at Stony Creek, Gippsland, on December 11, 1915, and had, as a result of the fall, a compound fracture of the lower end of the right humerus, just above the lower epiphysis. The wound in front of and slightly above the elbow joint was looking fairly healthy. An X-ray photograph was taken on the day of admission, showing that the lower epiphysis of the humerus, together with a portion of the lower end of the diaphysis, were displaced backwards and upwards and the lower sharp end of the diaphysis that had penetrated the skin, was lying in such a position that flexion of the elbow joint beyond a right angle was impossible. An attempt under an anæsthetic was made to force the lower fragment

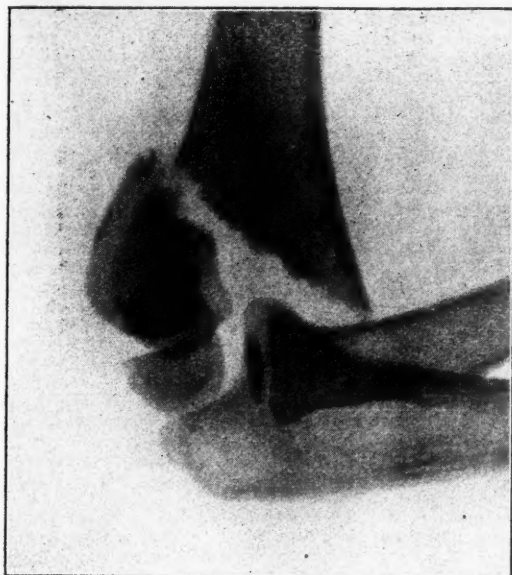


FIGURE I.
Skiagram taken on December 17, 1915.

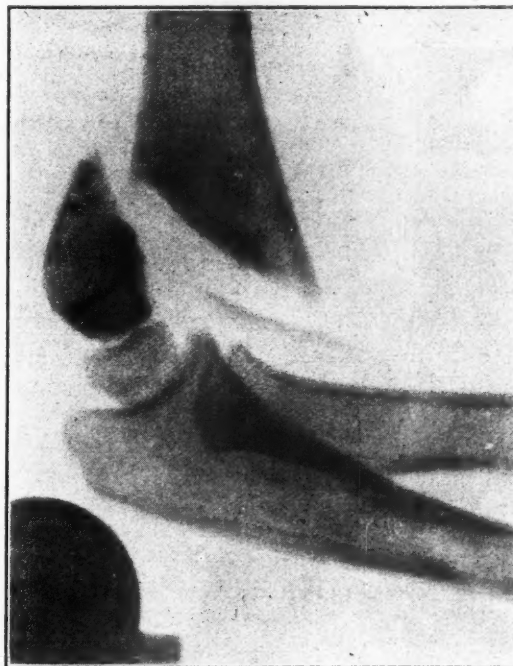


FIGURE II.
Skiagram taken on December 21, 1915.



FIGURE III.
Skiagram taken on December 24, 1915.

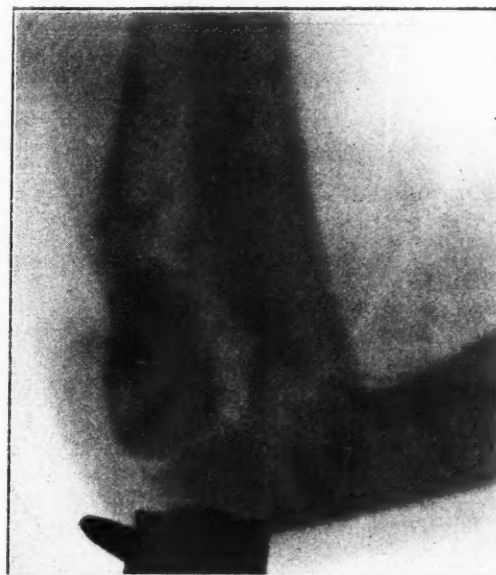


FIGURE IV.
Skiagram taken on January 3, 1916.

into better position and to flex the elbow beyond a right angle; but, as six days had elapsed since the injury, it was found to be impossible to improve the position by manipulation and the partially septic wound contra-indicated

any operative interference. In view of the result in a case reported by Arbuthnot Lane, it was determined to leave it to nature, and the elbow was put upon a splint with as much flexion as possible at the elbow joint. The first skiagram

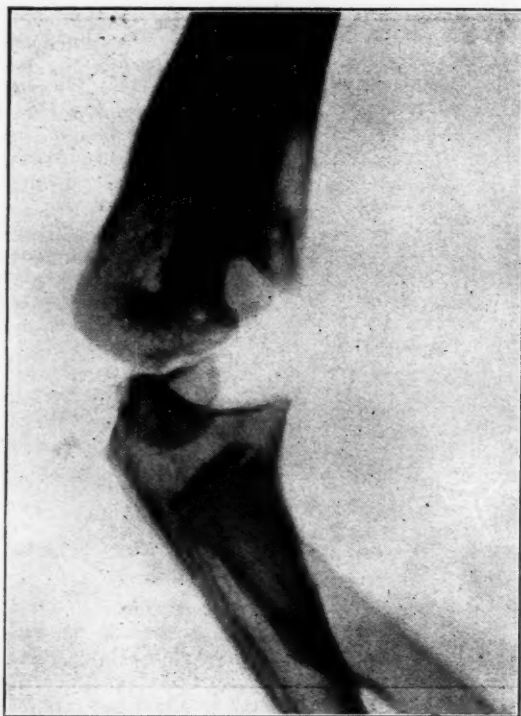


FIGURE V.
Skiagram taken on April 17, 1916.



FIGURE VI.
Skiagram taken on April 26, 1917.



FIGURE VII.
Skiagram taken on April 9, 1918.

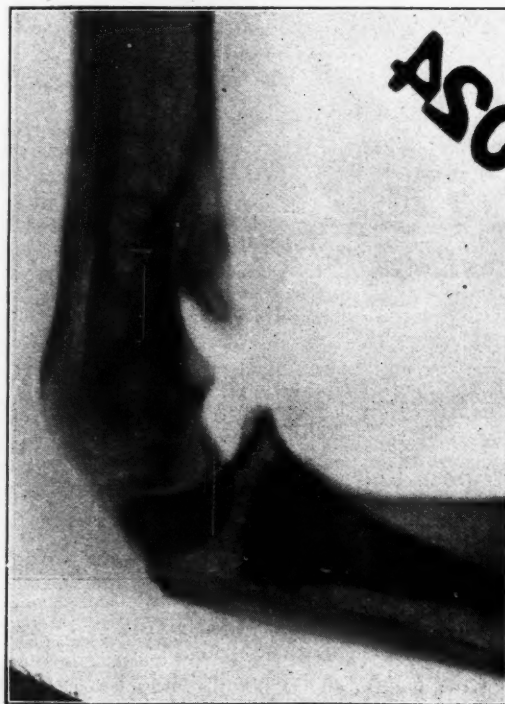


FIGURE VIII.
Skiagram taken on April 23, 1919.

taken on December 17, 1915, six days after the accident, showed no sign of any new bone formation.

The second skiagram, taken four days later, showed a distinct shadow of new bone formation in the sleeve of periosteum, lying behind the lower end of the shaft of the humerus.

The third skiagram, taken thirteen days after the accident, showed a very marked development of bone in the periosteal bed and also indicated that a certain amount of absorption was beginning at the lower end of the diaphysis of the humerus, which was uncovered by periosteum.

The fourth skiagram, taken 23 days after the accident, showed a shaft of bone lying behind the old diaphysis and merging into it. At this stage the boy left the hospital, with the wound healed and his arm in a sling, and he was told to use his arm as much as he liked.

On April 10, 1916, he was using his arm freely. The flexion was still limited to an angle of 90° and the extension was limited to an angle of 120°, the movements between these extremes being good. Supination and pronation at the elbow joint were perfect.

The fifth skiagram was taken on April 17, 1916, four months after the injury, and it then appeared that nature had almost completely absorbed the part of the diaphysis that had been stripped of periosteum, and had blended the newly-formed shaft laid down in the periosteal bed with that part of the diaphysis that still retained its periosteal covering.

On October 17, 1916, the extension of the elbow joint had increased from an angle of 120° to an angle of 130°, whilst his flexion was limited to an angle of 80°.

On April 21, 1917, his extension had increased to 150° and his flexion to 60° and the skiagram showed a further absorption of the old shaft.

On April 24, 1919, the flexion of the elbow was practically perfect, measuring with the goniometer 40°. The extension was still limited to an angle of 150°. The carrying angle of the right arm was equal to that of the left arm. A careful measurement of the bones of the upper and lower arms showed no difference in the length of the bones on the two sides.

The last skiagram shown was taken on this date three years and four months after the injury. The old shaft has not yet quite disappeared, but does not now interfere in any way with the flexion of the joint.

The lower epiphysis of the humerus is well shown and is still ununited to the new diaphysal end of the humerus. The new bone laid down over three years ago is still less dense than part of the old shaft and, comparing the first skiagram with the last, it is possible to see where the sleeve of periosteum passed to the epiphysis from the partially stripped diaphysis of the humerus.

Nature is also evidently straightening up the shaft of the humerus at its lower end and the bulbous end of the diaphysis is showing signs of returning to normal dimensions.

A similar series of skiagrams was published by Arbuthnot Lane in the September number of *The Practitioner*, 1902 (page 267), and it was owing to the good result obtained in his case that induced me to leave this case to nature, rather than resort to surgical interference.

Skiagrams in books on fractures showing this development of new bone in periosteal sleeves that have been detached from the diaphysis, have been spoken of as exemplifying longitudinal splitting of the shaft of the bone.

Epiphysal separations in children in their true sense, although still spoken of as common occurrences at the lower end of the humerus, must in the light of modern X-ray photographs be looked upon as rare occurrences. In practically all cases of so-called traumatic separation of the lower epiphysis of the humerus part of the lower end of the diaphysis is seen involved in the lower fragment.

This is to be explained by the fact that the periosteum is very thick and strong about the junction of

the diaphysis with the conjugal cartilage and epiphysis. The cartilaginous mass of the epiphysis is intimately connected with this tough periosteum. By stripping the periosteum from the shaft of the diaphysis it will be found that the removal of the epiphysis is simplified. The juxta-epiphysal region of Ollier at the end of the diaphysis is the soft spongy layer of the bone uniting this later with the conjugal cartilage. This region is the weakest part of the bone and the one which gives way first to external violence.

When a fracture occurs in this region the sharp end of the diaphysis lacerates the periosteum and goes through it like a button through a button hole and the lower fragment of the humerus passes backwards or forwards, inwards or outwards, carrying with it a sleeve of periosteum. The amount of stripping of the diaphysis is greater in a compound fracture than in a simple fracture.

This sleeve of periosteum then fills with blood. If an immediate attempt be made to replace the lower fragment, it is often easy to get the fragment back into its periosteal bed and in backward separations full flexion retains the fragments in excellent position.

AN INTERESTING PROBLEM IN FORENSIC MEDICINE.

By W. A. T. Lind, M.B., Ch.B., (Melb.),
Pathologist, Victorian Lunacy Department.

The association of ulceration of the ileum with other bodily injuries found in each of three *post mortem* examinations made on persons dying insane may be a matter of coincidence, but the histories of the cases are sufficiently interesting to warrant their being recorded, especially as the text-books on forensic medicine so far examined have failed to record similar findings. The injuries in all three cases must have been produced by violence applied to the chest and abdomen, presumably by someone kneeling on the supine victims. The examinations were made in the ordinary routine, under instruction from the coroner, who holds an inquiry in the case of every person who dies while being held by an order in the Metropolitan Hospitals for Insane, Victoria.

In each of the cases the discovery of evidence of violence was quite unexpected. This might be thought to be suggestive of neglect on the part of the medical men in charge of the patients, but those who work among the insane, will endorse the statement that in certain types of insanity, where the mental symptoms mask physical ailments, the practice of medicine is practically veterinary. One might even proclaim, further, that the mental disease disarranges the symptomatology of the ordinary ailments of the body. To see *post mortem* an appendiceal abscess, which during life was associated with level abdomen, normal pulse, normal temperature and absence of local tenderness, has been the experience of the writer; medical officers in hospital for the insane can mention equally anomalous instances.

The first patient of this series was J.D., aged 42, a general paralytic, who was received at the Receiving House, Royal Park, on August 2, 1917, and was transferred to Yarra Bend on August 8, 1917, with a record of having been a "padded-room case" during

his stay at Royal Park. Prior to his reception at Royal Park he had been roaming at large in a dazed condition, getting kicked out of fowl-houses by irate householders, who did not appreciate his mental condition. It is not necessary to enter into details concerning the evidence given at the official and coronial inquiries in these cases, as the purpose of this paper is solely to record the peculiar nature of the *post mortem* findings. For the sake of brevity, the description of the pathological changes in the organs not directly concerned with the cause of death will be omitted. The *post mortem* examination was made on August 11, 1917. There was a slight bruising over the upper part of the front of the abdomen and some bruising of the skin in the region of the thyroid. There was also a small bruise on the head. On examination of the interior of the body, it was found that there was a large bruise of the liver on the right side and that the sixth, seventh, eighth and ninth ribs were broken. The muscles of the larynx were bruised and there was extravasation of blood under the mucous membrane around the false cords. On opening the abdominal cavity there was found a general peritonitis in an early stage, due to the rupture of an ulcer in the ileum, not far from the caecum. The ulcer was recent, solitary, round, about five millimetres in diameter and not associated with disease of the intestines. Diligent search for foreign bodies or hat-pin stab in the abdominal wall was made with negative result. There was also no bruising of the surrounding parts.

The second patient was J.C.S., aged 57, who was received into Yarra Bend on February 19, 1918, suffering from delusional insanity. On October 27, 1918, he rolled off a seat, about 48 cm. off the ground, in the airing court, and was picked up dead. The *post mortem* examination was made on October 28, 1918. Externally there was found severe recent bruising of the inner aspect of the right knee and, to a lesser extent, on the left knee. On opening the body a fracture of the sternum between the fourth and fifth rib cartilages was discovered and the upper ramus of the pubis on both sides was fractured, with considerable extravasation of blood into the surrounding tissue. The bladder was not ruptured. There was general peritonitis, due to a perforation of an ulcer of the ileum. Except that the ulcer was slightly larger than in the first case, the same description will suffice for both lesions. The upper ribs of this patient tested *post mortem* were unduly frangible and the lower ones were unduly resistant. The injuries were all recent. Needless to remark, the coroner would not accept the statement that the only cause of the injuries was the fall off the seat.

In the third case the patient was 87½ years of age and was received at Royal Park on June 24, 1919, suffering from senile insanity. He was transferred to Kew on June 26, 1919, as a stretcher patient and died on July 4, 1919. At the *post mortem* examination, which was made on the same date as his death, the sternum was found fractured at the level of the third rib and the left side of the larynx internally was contused, as in garrotting. In the ileum there was an ulcer about the size of a threepenny piece, with a clean surface, not perforated, apparently ready to commence repair. There was also a colitis

present, similar in appearance to the terminal colitis of chronic nephritis, from which this patient also suffered. There was no bruising of the abdominal wall to suggest injury of the underlying structures and, although some of the ribs fractured too easily, some of them were unduly hard. The patient's legs showed considerable excoriation, as if he had been dragged along the ground. All the external marks of injury were present when he was received at the Receiving House, Royal Park. There is a history of "rough house" prior to his reception, for, in spite of his age, he was very strong physically.

Summary.

In these cases, all of which may be fairly judged to have been caused by violence, such as kneeling on the supine body while gripping the throat, the main question, so far as this paper is concerned, is what association had the ulceration of the intestine to the other injuries. Personal experience in this class of work scouts the idea that the ulcers are a matter of coincidence, due, for example, as medical counsel suggested, to a small gumma in the intestinal wall. In the absence of other disease, such as typhoid, tubercle, foreign body, or any other possible factor in ulcer formation, and influenced, no doubt, by the fact that in each case there were present in other parts of the body the results of violence, it may reasonably be said that the ulceration is the result of trauma, although with only one case to go upon when it occurred for the first time that opinion could not be so boldly asserted. As to how the trauma caused the ulceration, the writer is not prepared to say. It is quite easy to see how violence applied to the abdominal wall could rupture the bowel, as has been recorded in forensic works, but the formation of a small circumscribed ulcer, always about the same part of the intestine, is not so easily explained. An analagous condition in the duodenal ulcer following some cases of burns might be quoted as a similarly unexplained phenomenon. In all of the cases under discussion the position is obscured by the fact that those who could throw some light on the manner in which the injuries were sustained, would not come forward and give evidence, either because they were themselves guilty of brutality, or were afraid of the consequences of informing on the guilty party.

Reports of Cases.

PNEUMOCOCCAL ULCERATION OF PHARYNX.¹

By Bryan Foster, M.B., etc.,

Aurist, No. 5 Australian General Hospital; Assistant Surgeon, Victoria Eye and Ear Hospital.

The patient is a male, æt. 25, an Australian Imperial Force soldier, who "went sick" at a military camp in England in the winter of 1917. He had previously enjoyed good health. His statement is that he had severe headache for a week. This was followed by stiffness and soreness of throat, which swelled inside, preventing him eating. Drinks returned through his nose. After six weeks in hospital his condition had improved sufficiently to enable him to eat in comfort, but in another three weeks the symptoms recurred. He was suspected of diphtheria while in hospital and seven swabs were taken at intervals for examination.

¹ Notes on a case shown at a meeting of Eye and Ear Section of the Victorian Branch of the British Medical Association on June 3, 1919.

Each time the report was negative. His blood was also examined and the Wassermann test gave a negative response. He returned to Australia nine months ago and has since been under my observation at No. 5 Australian General Hospital.

The further history is that the condition has persisted with many short intervals, when he has been almost free from symptoms and the ulcers almost healed, only to break out afresh, with a return of deep serpiginous ulceration.

Examination shows that there is now extensive destruction of the faucial pillars and of the mucous membrane of the pharyngeal wall. These areas have been replaced by scar tissue. There are, further, several deep linear ulcers in an active state. The area of the posterior pharyngeal wall affected extends well up into the naso-pharynx and below to the level of the epiglottis. The condition has now persisted for over two years, and shows no sign of clearing up. Various treatment has been tried without benefit, i.e., vaccines, swabbing the pharynx with *liq. arsenicalis*, solutions of silver nitrate, zinc sulphate, iodine, etc. Although venereal history is negative and the Wassermann test applied since his return to Australia was again negative, a vigorous course of anti-syphilitic treatment was given without apparent effect.

I must confess that at first I thought the condition was Vincent's angina, which, at the time, was very prevalent in soldiers. Smears, however, did not show the characteristic bacillus and spirillum of Vincent's ulceration, and cultures made on several occasions by Dr. Roy Watson showed the pneumococcus constantly present in almost pure culture.

The condition appears to be extremely rare and is not referred to in many popular books on throat diseases.

W. G. Porter's excellent little manual contains a short description, as follows:—

Semon has described a very rare and interesting affection of the throat, which, though it is probably due to the pneumococcus, resembles in many respects a syphilitic lesion. His cases differed from any known throat condition in that they presented the most extraordinary fluctuations in severity, varying from intensely painful inflammation and ulceration to almost entire disappearance of symptoms, followed by repeated and unexpected recrudescence, until a complete cure was finally attained. Two of his three cases were characterized by absence of pyrexia and by marked asthenia, and the ulceration was succeeded by loss of tissue, having the punched-out appearance characteristic of a syphilitic lesion; in both cases the pneumococcus was found on culture and there was no response to anti-syphilitic treatment. I have also recorded a case of chronic pneumococcal ulceration of the throat, which was wholly unaffected by treatment. After a year spontaneous recovery resulted.

CARCINOMA OF THE ASCENDING AND TRANSVERSE COLON.¹

By John Corbin, M.R.C.S., L.R.C.P.,

Acting Honorary Surgeon, Adelaide Hospital.

J.L., *et. 56* years, was admitted to the Adelaide Hospital in the evening of December 23, 1918, suffering from intestinal obstruction. The obstruction was not relieved by enemata and vomiting supervened on December 24, 1918. An exploratory incision was made in the middle line. The small intestines were found to be much dilated and the site of the obstruction was just above the head of the caecum. The incision was closed and a second muscle-splitting incision was made. Through this the dilated head of the caecum was pulled out of the wound and a Paul's tube inserted. The obstruction was thought to be malignant.

On January 10, 1919, an incision was made in the right rectus and the middle of the transverse colon was united to the lowest part of the ileum by lateral anastomosis. The transverse colon was chosen, as a small nodule of what appeared to be secondary deposit was found in the hepatic flexure.

The patient made a good recovery from both operations and on January 21, 1919, under ether given by the open

method, the incision surrounding the original caecostomy wound was opened and enlarged backwards and a vertical incision in the right semilunar line joined up with it. The caecum, ascending colon and a portion of the transverse colon were removed. The small intestine was closed, the end turned in and over-sewn. The same was done with the free end of the transverse colon.

The patient again made an uneventful recovery, though he suffered somewhat from shock immediately after the operation. This was rapidly relieved by repeated injections of small quantities of saline solution.

The microscopical examination of the growth showed it to be a carcinoma.

THE MAYO CLINIC.

A medical practitioner, having had the opportunity of visiting the Mayo Clinic at Rochester, United States of America, as a patient, has supplied us with the following interesting account of that institution.

An account of a recent visit as a patient to this world-famed clinic may be of interest as showing the efficiency and thoroughness of this huge corporation—the life work of the two brothers, Charles and William Mayo.

Rochester is a small town situated about 350 miles north-west of Chicago, with about 10,000 inhabitants and a transient population of another two to four thousand people, patients and their friends who are catered for at many hotels, boarding houses and cafés.

The public notices show in themselves how the town exists for the clinic and its patients, such as at the special entrances to a church: "For wheeled chairs only," and another curious one in the lobby of the largest hotel: "Guests are requested to refrain from discussing operations in the dining room," all show the large factor in the town life played by the visiting patient.

The clinic itself is quite apart from the many private hospitals, where the ordinary professional visitor views the operative surgical work. It consists of a spacious five-storied brick and stone building, with nests of separate rooms and a large, heated waiting hall, with alphabetically marked appointment desks at each corner.

The number of patients dealt with may be gauged by the fact that last year over 52,000 attended and that since the card system was introduced in 1907, over 260,000 histories have been recorded and tabulated in the statistical department.

The staff consists of at least 250 female clerks and attendants and a qualified professional personnel of about 170, male and female.

These latter are allotted to the various services, *e.g.*, there are seven or eight physicians in the department for affections of the digestive system, each with his own staff of assistants; in other special branches there are separate staffs. Contrary to preconceived ideas, the clinic is not now confined to surgical diseases, but has extended to the special branches, orthopaedic, ophthalmic, neurological, skin and general medicine, etc.

Each specialty has its separate rooms and the larger, such as the X-ray and dental, their own suites of rooms. One desk in the main hall is reserved for patients with goitre, whilst another department selects patients for admission for operation to the special private hospitals and in another room patients are re-examined with a view of eliminating from those to be operated upon next day persons with catarrhal affections, in order to lessen the risk of post-anæsthetic pulmonary complications.

On the upper floor is a fine pathological museum, where all specimens removed by operation are shown, whilst on the third floor is a spacious reading room and adjacent library of 8,500 volumes and a large lecture hall with lantern. Little or no treatment is carried out here outside the X-ray, therapeutical and post-operative dressing departments. It may be mentioned in passing that the average duration of the stay in hospital for all patients undergoing operation last year was 8 to 9 days.

In the internal arrangements of this immense building of several hundred rooms, there are many ingenious labour- and time-saving devices to be noticed. Electricity is used in

¹ Read at a Meeting of the South Australian Branch of the British Medical Association, on February 24, 1919.

innumerable ways, from that of power for the elevators to driving the delicate centrifugal machines in the blood testing and urinalysis departments. A time-saving device brought audibly and frequently under notice is that of the installation of a buzzer in every room with a separate signal for each member of the major consulting staff, who, on hearing his own call from the building exchange, at once answers at one of the many telephones, wherever he may happen to be.

Another method of calling a member of the senior staff is by means of coloured electric lights, each member having a colour assigned to him. These light up inside his consulting room above the doorway and, as all the consulting rooms of the senior staff are in a long corridor with similar coloured lamps outside each door, the person called simply steps outside and sees at a glance his assigned colour glowing outside the door of his colleague who wants him.

The statistical department in the basement is a marvel of organization, with some half dozen or more female clerks classifying, indexing and cross indexing names, diseases and patients' numbers and percentages on the cards of nearly 300,000 cases. To test the system a question was asked as to the frequency of malignant disease of the duodenum and in a moment the answer was given that there were 3 cases recorded out of over 1,200 cases operated upon for malignant disease of the bowel and the names, numbers and histories of the patients were also produced.

To convey some idea of the actual working of such a large corporation and to show that it is not unwieldy and neglectful of the personal factor, the experiences of the writer seeking an opinion for further operation for a digestive trouble may exemplify better than further generalities the methods of diagnosis employed.

On entering the entrance hall, the patient is directed by a uniformed porter to a registration desk, where full personal particulars are taken and, after a card of identification is assigned (numbered in the 270 thousand), the main symptom is asked for and an allotment made to the digestive service desk at the opposite side of the hall, where, as a special favour as a medical practitioner, an appointment is made to see a physician three days ahead, although at this particular time the ordinary patient was kept waiting 8 days. In the meanwhile the patient is directed to furnish a 24-hour specimen of urine in a special bottle with minute directions printed on it. The patient writes his name and number on the label and sends the specimen to the laboratory.

The examining physician, who only sees about eight patients daily, takes a most minute history and examines completely the various systems, neurological, skin, teeth, rectal, etc.. He hands to the patient various coloured envelopes which, together with the card of identification, are presented at the various departments indicated, beginning the same afternoon at the blood test department, where the pressure is taken, together with a leucocyte count. On the same evening the instructions contained on one of the coloured envelopes as regards a test meal are followed by eating 15 raisins (obtained pipless in a sterile envelope) an hour after the last meal. Next morning at 7 a.m., in the special gastric room, after an unsatisfactory meal of eight biscuits and two glasses of water, a small tube is passed and left in the stomach for half an hour and a specimen drawn off by a small syringe. After this the second coloured envelope presented at the X-ray department, procures a barium meal, the passage of which through the alimentary canal is examined on the fluorescent screen six hours later and, at the same time, two plate exposures of the stomach are taken.

Next day the examining physician, having received the various reports from the departments visited, decides that a special functional phenolphthalein test is required from the urinary department as a single red corpuscle had been reported in the specimen submitted. After another supperless evening and an aperient as enjoined, next morning an injection is given. The patient is handed a graduated bottle with printed specific instructions to return a sample in 2½ hours and "not to spill any without reporting to the physician." Later, in the X-ray department in the urinary section, four plates are taken of the kidney and pelvic regions and ten film exposures in the dental section. The result of the former showing a suspicious shadow in the

sigmoid, necessitates two extra plates being taken of the pelvis next morning, which prove normal.

The following day all the reports being now entered on the history sheet, the examining physician passes it on to the consulting physician who, in turn, hands the case over to the consulting surgeon, Charles Mayo, who decides on the afternoon of the seventh day against further surgical interference.

Every courtesy and even preference before other patients are given to the professional patient and after seven days' attendance at this clinic one leaves profoundly impressed with the systematic thoroughness of this wonderful corporation and convinced that the motto of Emerson displayed in the consulting room of Charles Mayo has been achieved: "Have something that the world wants and, though you dwell in the midst of a forest, it will make a pathway to your door."

Reviews.

CEREBRO-SPINAL FEVER.

C. Worster-Drought and A. Mills Kennedy have published an exhaustive volume on epidemic cerebro-spinal meningitis, with extensive bibliography and a good index.¹ The chapters are as follow: general observations; the meningococcus and allied organisms; dissemination of the disease; predisposing causes; incubation period and mode of invasion; symptoms—course—complications; hydrocephalus; the cerebro-spinal fluid; the blood; diagnosis; acute infections not due to the meningococcus, which occasionally accompany cerebro-spinal fever; lesions due to the meningococcus, other than those which are associated with meningitis; pathology and morbid anatomy; prognosis; prophylaxis; treatment; serum disease in cerebro-spinal fever; sequelae. The plates are excellent, but some unnecessary. The authors summarize that the mode of entry by the meningococcus is almost certainly by the blood stream. In the ordinary type of case the coccus is carried to the meninges by the blood within a few hours, without definitely infecting the blood itself. In some cases definite blood infection (true septicaemia) occurs and the meningitis may be slight. Or the patient may die from septicaemia before meningitis occurs. In other instances the coccus infecting the blood may invade structures other than the meninges, e.g., the cardiac valves or joints. Skin rashes are fully described, the characteristic forms being maculopapular, patchial and purpuric. Mottled erythematous rashes of a transient nature may occur at almost any stage. Herpes is described and well illustrated. Hematuria sometimes occurs in acute cases. Glycosuria is somewhat uncommon. According to some authors, meningococci may be isolated from the urine during the initial stages of the disease. As regards Kernig's sign, it is pointed out that it is of no diagnostic value in children below the age of two years, as at this age there often exists a physiological rigidity of the muscles which may yield a positive sign. Brudzinski's signs are three in number: (a) The identical contra-lateral reflex. Here the patient lies supine, with both legs extended. On flexing the leg and thigh of one side on the abdomen, the other leg follows suit as soon as the flexed thigh touches the abdomen. (b) The reciprocal contra-lateral reflex. One leg and thigh being flexed as before and the other extended, it is found that when the flexed leg is lowered to the extended position, the opposite limb undergoes in turn, flexion on thigh and abdomen. (c) *La signe de la nuque*. This is obtained by flexing the head of the patient on the trunk, the chest being held down by the observer's hand, when flexion at the hip and knee also occurs.

The course taken by the disease has prompted the authors to make the following classification: six acute types; two special types; two subacute types; two chronic types and relapses. A well-marked leucocytosis is a constant feature during the acute stages and also usually in subacute and chronic cases. The leucocytosis often varies in degree from

¹ Cerebro-Spinal Fever: The Etiology, Symptomatology, Diagnosis and Treatment of Epidemic Cerebro-Spinal Meningitis, by C. Worster-Drought, M.A., M.B., and Alex. Mills Kennedy, M.D.; 1919. London: A. & C. Black, Ltd.; Demy 8vo., pp. 514, with 8 plates and 56 line illustrations and charts. Price, 30s. net.

day to day and depends on a relative increase in the polymorpho-nuclear cells. A lymphocytosis may be occasionally observed in infants and young children. The chief and characteristic diagnostic signs are: (i.) Sudden onset in a patient previously well or complaining only of a "cold," rigors, increasingly severe headache; vomiting. (ii.) Cervical muscular rigidity, flexion sign. (iii.) Kernig's sign. (iv.) In infants, tension and bulging of the anterior fontanelle. Secondary signs, of value when present are: (i.) petechial or purpuric rash; (ii.) bladder condition, retention, incontinence; (iii.) plantar stimulation, active withdrawal of leg; (iv.) pulse-temperature ratio, comparatively slow pulse, with high temperature. In the differential diagnosis the following conditions have to be considered: acute infective processes (influenza, etc.), diseases of the central nervous system other than meningitis, other forms of meningitis and miscellaneous conditions, such as acute osteomyelitis of the spine, gastro-enteritis with meningism, etc. In prophylaxis, atomization of carriers with zinc sulphate (1% to 2% solution) was found to be tolerated rather better than chloramine, but the results were not as satisfactory. The meningococcus exists in the naso-pharynx of carriers as a saprophyte and the carrier does not free himself by becoming immune.

Colebrook and Tanner investigated the results of treating ten persistent carriers by active immunization with vaccine. After a short time in five the meningococcus was absent, but later some re-appeared; the other five were unaffected. There is no definite evidence as to what degree of immunity one attack of cerebro-spinal fever confers. An example is given of an individual suffering from two definite attacks of the disease within thirteen months. In determining the therapeutic value of serum, Flexner and Jobling, having found other tests unreliable, employed the opsonic test. Sophian, however, advances the following objections: (a) irregularity and inaccuracy in readings of all opsonic work; (b) the fact that the meningococcus family comprises a number of different strains, each strain reacting differently with the autogenous serum and the sera of other members of the group.

Accidents during lumbar puncture are mentioned. A sharp pain down the thigh and leg only means that the needle has touched one of the roots of the *cauda equina* and is of no significance. Incontinence of urine and faeces may occur, due, no doubt, to the sudden stimulation of the third and fourth sacral nerves. Accidental breaking of the needle is a very rare occurrence. Treatment by hexamine is referred to. This drug is one of the very few excreted into the cerebro-spinal fluid. Its antiseptic properties depend on its partial dissociation into formaldehyde. This dissociation, apart from temperatures above 50° C., only takes place in an acid medium. In cerebro-spinal fever in the vast majority of cases, the cerebro-spinal fluid is alkaline and at no time were the authors able to demonstrate the presence of formaldehyde, even when this fluid was neutral or faintly acid. Helmitol has also been tried, which liberates formaldehyde in alkaline as well as acid media. In no case, however, was it possible to demonstrate the presence of formaldehyde. No definite value can be attached to helmitol in treatment. Serum disease, following injections of serum is well discussed, with paragraphs on anaphylaxis and anti-anaphylaxis. As regards treatment of anaphylaxis, the authors state that the more severe symptoms can be referred to vagus irritation and sympathetic depression, therefore atropine and adrenalin should be injected intravenously.

Hospitals.

THE QUEEN'S MEMORIAL INFECTIOUS DISEASES HOSPITAL.

In the annual report of the Board of Management of the Queen's Memorial Infectious Diseases Hospital for the year ending June 30, 1918, it is announced that the new ward pavilions for the treatment of patients suffering from epidemic cerebro-spinal meningitis was opened early in the year. Patients from the Melbourne, Alfred and Children's Hospitals were transferred to this annex. Nurses with

experience of this disease were lent from the three hospitals and Dr. Noel T. Bull was transferred by the Minister for Defence to the Hospital. It was thus possible to utilize the accommodation provided without loss of time or injury to the patients. The Board subsequently made its own arrangements.

Patients are admitted to the Infectious Diseases Hospital for the treatment of diphtheria, morbilli, scarlatina, pertussis, epidemic cerebro-spinal meningitis and acute poliomyelitis.

The total number of patients admitted during the year was 3,874, while 321 patients were still under treatment on July 1, 1917. There were 137 deaths and 3,583 patients were discharged. The mortality was therefore 3.61%. In 28 instances the death occurred within 24 hours of admission and, if these be eliminated, the death-rate is reduced to 2.89%.

Diphtheria.

The number of patients admitted suffering from diphtheria was 2,361. During the course of the year 2,179 were discharged and 59 died. The case mortality was 2.56, while, if the 18 patients whose death occurred within 24 hours of admission be excluded, the death-rate works out at 1.79%. Dr. Scholes, the Medical Superintendent, expresses the opinion that increased knowledge and improved methods of treatment were largely responsible for the lower death-rate.

Of the 2,361 patients admitted during the year, 1,760 were suffering from faucial diphtheria. The average amount of antitoxin administered to each patient was 8,614 units. Only three patients died. There were 378 patients suffering from faucial and nasal diphtheria and, of these, 38 died. The average amount of antitoxin given was 35,899 units. Faucial and laryngeal diphtheria occurred in 125 patients and was fatal in nine. The patients received on an average 24,248 units of antitoxin. The number of patients with laryngeal diphtheria was 44 and, of them, six died. The average amount of antitoxin given in this class was 16,273 units. There were 36 cases of nasal diphtheria without a death and 17 of faucial nasal and laryngeal diphtheria with three deaths. The average amount of antitoxin given in these two classes was 7,227 and 18,118 units respectively.

The following table illustrates admirably the value of antitoxin in the treatment of the disease.

No. of Days Ill Before Admission.	No. of Patients	Deaths.	Mortality, %
One	593 ..	4 ..	0.7
Two	768 ..	11 ..	1.4
Three	463 ..	18 ..	3.9
Four	212 ..	12 ..	5.7
Five	95 ..	38 ..	3.2
Six	34 ..	1 ..	2.9
Seven	79 ..	6 ..	7.5
Over Seven	54 ..	1 ..	1.8
Not Specified	63 ..	3 ..	4.8

The effect of age on mortality is well exemplified in the series of cases. There were 538 children under five years of age and 29 of these or 5.4% died. There were 889 children between five and ten years of age; of these, 23 or 2.6% died. There were 459 children between 10 and 15 years of age and five or 1.1% died; and there were 297 individuals between 15 and 25, of whom two or 0.6% died. No deaths occurred among the 178 patients whose ages varied between 25 and 65 years.

In regard to the effect of the involvement of the larynx in the course of a diphtheritic infection, some interesting information is given. The total number of patients with laryngeal diphtheria was 186. It was necessary to relieve the urgent dyspnoea 60 times. In 57 cases intubation was carried out and in three tracheotomy. All three of the tracheotomized children died. From the figures published there is evidence of the extreme danger of a severe involvement of the larynx necessitating intubation or tracheotomy. Of the 60 children who were operated on, 13 died. Of these, 38 were over five years of age and ten of them died. Seven of the 18 deaths took place within 24 hours of admission. It thus appears that of the 179 patients suffering from laryngeal diphtheria (excluding those in *extremis* on admission) 11 or 6.1% died.

There were 390 patients who suffered from diphtheria associated with scarlatina, morbilli or some other infective condition.

Scarlatina.

The number of patients admitted on account of a scarlatina infection was 995. There were 126 under treatment at the beginning of the year and 146 under treatment at the end of the year. The number of those discharged was 956, while 19 patients died. The mortality works out at 1.91%. Of the 995 patients admitted, 166 were under five years of age and, of these, nine died, which yields a mortality of 5.4%, while 394 were between five and ten years of age and seven of them died, which yields a mortality of 1.7%. If these two age groups be taken together, the mortality of the disease is found to be 2.85%. There were 217 children between 10 and 15 years and of these two died, which is equivalent to a mortality of 0.9%. The number of patients between 15 and 25 years of age was 146, of whom one died. In addition, there were 72 adults under treatment for the disease. The greatest number of patients were admitted in October and November and the lowest in February. A second peak in the admission curve occurred in the month of June.

Morbili.

Measles, as seen in the Queen's Memorial Infectious Diseases Hospital, is an extremely serious disease in children under five years of age. The total number of patients admitted was 83, including 37 children under five years of age. Five of these babies died and consequently the case mortality for this age group was 13.5%. No deaths occurred among the 46 patients whose ages varied between five and 45 years. It must, however, be pointed out that in six of the patients *Bacillus diphtherie* was found on admission in the throat or nose of these little patients. The most common complication was broncho-pneumonia, which occurred 17 times. Gastro-enteritis and colitis were met with 10 times, *otitis media* six times, laryngitis five times, pertussis and cervical abscess twice each and mastoiditis once. It should be noted that measles in male children under the age of five was more common than females (21 to 16), while over the age of five there were twice as many female patients as males.

Cerebro-Spinal Meningitis.

The information concerning cerebro-spinal meningitis forms a very interesting chapter in the report. The number of patients dealt with was not large, 68 having been admitted during the year. Of these, 32 died, 34 were discharged and two were still under treatment at the end of the 12 months. The gross case mortality was 47.76%. There were 17 patients under five years of age with nine deaths, which equals a mortality of 52.9%. Eight of the patients were between five and ten years of age and one died, while four were between ten and fifteen and two died. In the age group 15 to 25 years there were 19 patients. Of these, six died, while in the next group up to 35 years of age there were six deaths among nine patients. In the age group 35 to 45 there were seven patients and six deaths. Finally there were four patients between 55 and 65 and two of them died. The figures for each age group are too small to justify the application of a percentage mortality, but from the figures it is seen that the type of disease met with in persons between the ages of 25 and 45 is extremely fatal, 12 patients out of 16 having died. Dr. Scholes points out that the high mortality and the apparent inefficiency of treatment may be partly explained by the late arrival of many of the patients in the hospital. He states that much valuable time was lost in several cases by the practice of awaiting the result of a bacteriological examination of the cerebro-spinal fluid before the patients were sent to the hospital. The opinion is expressed that better results may possibly be obtained, if treatment by drainage and the intrathecal injection of antiserum be applied early. Our knowledge of the aetiology and pathology of this disease is unfortunately too meagre, as yet, to justify any positive statements concerning the prophylaxis and treatment of the disease. A very useful purpose would be served if Dr. Scholes were given additional assistance for the purpose of instituting research into the unsolved problems connected with cerebro-spinal meningitis.

Pertussis.

Only 39 cases of pertussis were under treatment at the hospital. Nearly all these cases were complicated. Three of the children died within 24 hours of admission, while five

died later. The mortality appears, in consequence of this, to be extremely high. There were 29 cases complicated by broncho-pneumonia, 11 by gastro-enteritis and colitis, nine by cardiac involvement, three by diphtheria two by *otitis media* and hæmorrhage and one by cervical abscess. All the patients were under ten years of age.

Anterior Poliomyelitis and Encephalitis.

The number of patients admitted suffering from these conditions was 18. Eleven were discharged, three died and four were still under treatment at the end of the year. Two of the deaths resulted from respiratory paralysis, while the third was apparently due to toxæmia and hæmorrhage. There were 12 patients under five years of age, two between five and ten, two between 15 and 25 and two between 25 and 45.

Other Diseases.

Among the other diseases on account of which the patients were admitted during the year, tonsillitis and pharyngitis were responsible for a large majority. There were 224 patients with this condition, four of whom died. Epidemic parotitis and pneumonia were each present in ten patients, influenza in eight, varicella in seven, Vincent's angina in four and tubercular meningitis in two.

We have to congratulate Dr. Scholes on the excellent manner in which he has presented his report and on the wealth of information conveyed in its few pages.

MEDICAL OFFICERS' RELIEF FUND (FEDERAL).

The trustees acknowledge, with thanks, the following donations and promises:—

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Total to September 24, 1919, £6,677 7s. 9d.

The Medical Journal of Australia.

SATURDAY, SEPTEMBER 27, 1919.

Team Work.

Everyone who has endeavoured to marshal the facts concerning the provision of medical attendance on all sections of society and to find a general scheme for the better regulation of medical practice, has encountered one almost insuperable difficulty. It is universally recognized at the present time that medicine has become so wide a collection of sciences that no one practitioner can master all its branches. The general practitioner, even if he possesses more than average ability and even if he is equipped with more than average knowledge, cannot give his patients the advantage of the special diagnostic acumen and manipulative skill that his specialist colleague is able to dispense. In hospitals and other medical institutions, the patients enjoy the facilities offered them of investigation by specialists in the many departments. It is true that full use is often not made of team work, by which is meant the collaboration of specialists with the co-ordinating practitioner, even in our largest hospitals. In private practice, team work scarcely exists. The wealthy patient at times asks his attendant doctor for a consultation with a specialist. The attendant doctor rarely asks the patient to go to a dozen specialists, in order that the most thorough investigations of all the systems and of the alleged pathogenic agent may be carried out. In the case of the less well-to-do patient, team work is never attempted, while the lodge patient obtains it only when he is referred to a hospital for a particular purpose.

In the current issue of this *Journal*, an anonymous correspondent places before our readers his experience of a well-organized institute in America which has been established for the purpose of developing team work on a large scale. The details are highly interesting and are of importance to the Australian medical practitioner, although we trust that the commercial element which is inevitably associated with

a private undertaking of this kind, will not enter into any institution or establishment which may arise in the Commonwealth. The Mayo Clinic is an extremely expensive machine to run and in order that its expenses may be met, measures have to be adopted to insure that it is largely patronized. The town of Rochester advertises the Mayo Clinic. The advertisements penetrate the outer limits of the town and are found far away, exercising a powerful attraction for patients the world over. While the justification of a private institution of this kind may be questioned on ethical grounds, at all events when judged by British standards, there can be no two opinions concerning its inherent advantages. It is a most admirable institution and it embodies the elaboration of an almost ideal system of medical practice.

In an ideal re-arrangement of medical practice, there would be institutions analogous to the Mayo Clinic to which the general practitioner would send his patients in all circumstances demanding a refined diagnosis. That means in the majority of pathological conditions. This institution must not be privately owned, nor may it bear the name of any medical practitioner. The objection to State ownership would be that many of the most capable experts would refuse to serve on the staff. The institution may not be a commercial concern, owned by outside shareholders, for reasons which are obvious to every ethically-minded medical practitioner. We are therefore compelled to the remaining expedient that it should be owned by the medical profession. The ownership might be so arranged that the capital is supplied by medical debenture holders, who would receive a guaranteed interest for their money. There are objections and difficulties in the way, although these may not be insuperable. A second possibility is that the ownership might be vested in the whole profession of the State. The statutory body responsible for the registration of members of the medical profession might be empowered to collect from every member an annual registration fee, which should include a certain ear-marked sum for the establishment and maintenance of the team work institute. The management would then be placed in the hands of a board of medical practitioners, elected by the profession. The staff would be selected after public

advertisement by the board of management. Each member of the staff would receive a salary measured by the time spent in the institute and by the nature of the work undertaken. The patients sent for specialistic examination would be required to pay a single fee, proportionate to the fee paid to the family attendant. Lodge patients might gain admission by special arrangement, or they might be referred for the same purpose to the public hospital.

The establishment of an institution for all classes of patients for the purpose of making team work a possibility, would have the effect of introducing a progressive scientific spirit into general practice. If the proposal were carried out by the profession itself, it would remove an incongruity which mars medical practice to-day. Medical practitioners examine their patients, arrive at a diagnosis of the condition from which they are suffering and institute a form of treatment, without recognizing in a tangible manner that the greater part of the knowledge enabling them to carry out these functions, has been given to them by the research workers. More than that. The man who discovers the ætiology of a disease and renders it possible for an accurate diagnosis to be made, usually earns something like a bare living wage. The man who applies this knowledge, earns large fees. If the whole profession contributed to the institute for team work, it should be possible to guarantee to the laboratory worker, to the research student and to the genius who has no taste for practice, a good income commensurate with the value of his work instead of a pittance.

INFECTION BY MEANS OF THE HANDS.

It is well known that the majority of pathogenic microbes are not rapidly destroyed by exposure to the atmosphere or by slow desiccation. Since these facts have been recognized, it has been obvious that infection of the human subject could be brought about by the hands coming into contact with material containing bacteria and transferring these bacteria to the mouth and nose, which are portals through which germs frequently enter the body. Physicians note from time to time examples of these hand-borne infections and they occasionally record their observa-

tions for the information of others. Attempts have been made to account for the distribution of some epidemics by invoking the operation of infection by means of the hands. This has been chiefly in connexion with outbreaks of enteric fever related to a single typhoid carrier. Recently, the hands have been suspected as an important agency in spreading influenza among certain sections of the American Army.

Objects which have been fingered by hands moistened with saliva, are found around every person. Tramway tickets, paper notes and coins are passed from one person to another by hands which have often been used to shield others from the spray ejected during a cough. An enthusiastic student of hygiene was able to notice 119 points of contact to which he was exposed during the course of a single day. The opportunities of contaminating the hands during a day spent in the city are exceedingly numerous. It must, however, be recollected that the swallowing of the microbes picked up by the hands can be avoided, even if the soiling of the hands cannot be prevented. The habits of biting the nails and of moistening the fingers with the tongue and lips are dirty and mischievous. Every effort should be made to avoid their formation. If they have been acquired, special training is needed to remove them. Care should be exercised in avoiding the half unconscious act of passing the hands over the face and mouth. The hands should be invariably washed before meals. Steps might well be taken to insure that every café, restaurant and hotel provides lavatory accommodation for cleaning the hands.

Although all persons frequenting the company of their fellows must receive on their hands many times during the day germs derived from other persons, infection from this source is relatively uncommon. Compared with the chances of contamination of the hands, infection of adults from this source is certainly infrequent. This mode of infection is undoubtedly more common in children of school age. The younger the child, the greater will be the danger of hand-borne infection. The greater frequency of contagion may not be entirely due to more numerous infections, as children are more susceptible to the common bacterial diseases introduced through the nose and mouth. At home and in school the child

should be instructed to keep the hands away from the nose and mouth. Children should be informed of the dangers of placing articles which may have been soiled, in their mouths. They should be made to wash their hands previous to eating food of any description. In this way they will be educated against introducing germs into their mouths, even if these organisms may come into contact with their hands.

ANTIMONY IN BILHARZIOSIS.

Although bilharziosis is not a directly deadly disease, its disabling effects are sufficiently serious to cause uneasiness least it become prevalent in Australia. It is definitely established that the molluscs capable of acting as intermediate hosts are plentiful in South Australia and in other parts of the Commonwealth. The disease is extremely common in Egypt and it is known that a large number of soldiers who served in Egypt and the Sudan, became infected. The danger of the spread of the disease through men who had been on active service, was recognized by the military authority some time ago and steps were taken to anticipate the danger and to introduce precautionary measures against an introduction of the disease. The prophylaxis of the disease depends on the systematic detection of molluscs, *Bullinus* and *Planorbis*, their destruction and prompt detection of all infected persons. The patient can be rendered harmless to the community by education and control, while properly constructed privies and latrines are essential to success in the campaign.

The problem in Egypt and other heavily infected countries is much more difficult. Hitherto it has not been possible to eradicate the worm by drugs. In 1917 Dr. J. B. Christopherson, the Directors of the Civil Hospitals at Khartoum and Omdurman, having been impressed with the encouraging results obtained in the treatment of Leishmaniosis with tartar emetic, determined to try intravenous injections of this drug for bilharzial infections. During the past twelve months he has published several articles in the *Lancet*, *British Medical Journal* and elsewhere, claiming a specific action for antimony in this affection. In one of his latest communications, he sets forth at a considerable length his views, based on a series of seventy patients treated in hospital.¹ He admits in reply to criticisms that the drug is a dangerous one and postulates for successful treatment meticulous care in seeking contra-indications and in carrying out the injections into the veins. He gives the injections on alternate days. After various trials, he recommends that 0.12 gm. of *antimonium tartaratum* be injected into a vein after a few smaller doses have been given (0.03 gm. and 0.06 gm.). The maximum amount in the course should not exceed 1.2 to 1.5 grammes, although he has given as much as 2.16 grammes in thirty-one days. He found that less reaction followed the injections given in the morning three or four

hours before food than when given during the course of the day. In his experience the naked-eye appearance of blood in the urine disappears about four days after the commencement of the treatment. At the end of fourteen days, when a total quantity of 1.2 grms. has been given, the urine, previous coloured and cloudy from blood and ova, is clear and contains neither blood nor albumin. The ova are sparse and to a great extent sterile. He has surmised that the adult bilharzia in the portal veins are killed at an early stage and that the ova are damaged and killed later. The urine contains ova more or less disintegrated and discoloured for many months after the treatment has been completed. No recurrence of symptoms takes place and all attempts to hatch the ova in the diluted urine has failed in his hands. There is difficulty in determining the occurrence of cure. Hitherto Dr. Christopherson has not even been able to produce evidence of a direct action of antimony tartrate on the adult worm *in vitro*. He has immersed ova in a solution of the antimony salt and has determined that in a dilution of 1%, only about one half of them hatch, while the majority survive after hatching for a relatively short time. When the ova are immersed in the same quantity of water without tartar emetic, the majority hatch in four to five minutes, and the process is almost complete in one hour. When ova are immersed in a 2% solution of tartar emetic, the proportion of embryos that hatch is smaller and the life of those that survive is shorter. Further he found that if to 6 c.cm. of water and 0.1 c.cm. of urine containing ova, 0.03 gm. of *antimonium tartaratum* be added after the ova have hatched, the movements of the *miracidia* alter suddenly. He describes the process by stating that they "slow down, they squirm, they wriggle and they writhe, they have convulsions and, assuming a thicker and shorter form, they die. They do not all die, however; some appear to escape, but the period of activity is considerably diminished by the antimony tartrate in every case." Allowing for the enthusiast's licence, it would seem that the movements are modified and that some of the *miracidia* die in a solution of tartar emetic of 0.5%. The only support adduced on which the claim that the drug kills the adult worms in the portal veins is based, is the fact that in a single post mortem examination conducted on an Egyptian soldier who had been treated for bilharziosis by intravenous injection of tartar emetic, no worms were found in the portal veins. The man apparently died of influenza and pneumonia. A side issue is raised whether the tartar emetic produced the fatty changes discovered in the liver, kidneys and *vena cava*.

Dr. Christopherson's experience should impel other clinicians who are called upon to treat persons infected with bilharzia, to give intravenous injections of *antimonium tartaratum* a trial. The final verdict must be deferred until the reports of many observers have been received. It has long been known that tartar emetic, given by the mouth, is a very dangerous drug. The minimum lethal dose has been given by various authorities as 0.5 to 1 gramme, while some claim that death does not always take place until 2 or even 4 grammes have been taken. The obvious symptoms of poisoning when the drug is swallowed,

¹ *Journal of Tropical Medicine and Hygiene*, July 15, 1919.

are vomiting, diarrhoea, collapse and convulsions. Vomiting usually occurs after a single dose of 0.05 gramme. If the vomiting is prevented by opium or alcohol, the intestinal symptoms may be very severe. They include hæmorrhages and intense weakness. Chronic poisoning has been observed after doses of 0.013 gramme taken for several weeks. The pathological changes found after acute poisoning include fatty degeneration of the glandular organs and of the central nervous system. Studies of the toxicological action of antimony salts have revealed that the metal dissociates tissue protein and enters into a chemical combination with the amino acids. It is assumed that the disappearance of glycogen from the liver is due to this affinity for organ protein and that the same applies to changes found in the nerve cells of the central nervous system. Antimony, like arsenic, tends to accumulate within the animal body, although its excretion from a depôt or from the circulation is at first rapid. Dr. Christopherson has sought the collaboration of a chemist attached to the Wellcome Laboratories at the Gordon College, who recovered from the urine approximately one third of the antimony injected.

It is necessary to recall the experiments of Thompson and Plimmer on the effect of antimony salts on spirochaetes, especially *Spirochaeta pallida*. These experiments revealed a marked parasiticide action, but the practical employment of these salts was complicated by a very narrow margin between the therapeutic and the lethal doses. When organic compounds of arsenic were first employed in the treatment of syphilis, Ehrlich and many others found that the chief difficulty lay in discovering a substance which could be given in doses sufficient to produce a concentration in the blood and tissue fluids that would guarantee a destructive effect on the spirochaetes. Hitherto the search for an antimony compound satisfying this condition has been fruitless. According to Dr. Christopherson 0.5% is needed to inhibit the development of ova into healthy *miracidia*. He gives 0.12 grm. of tartar emetic in a single dose and it may be assumed that not more than 0.06 grm. is retained in the tissues. After ten doses have been given, the amount of tartrate of antimony deposited in the body may reach 0.6 gramme. Even if it be assumed that the bilharzial worms and ova have a greater affinity for antimony than have the organs and tissues of the body, it is difficult to believe that this very small quantity buried in the whole mass of blood, tissue fluids and tissues will be able to exert a sterilizing effect. In the second place, the doses prescribed appear to be perilously high, when compared with the lethal doses of the drug taken by the mouth. It must be remembered that there was a time when atoxyl was given freely in syphilis and other processes, with apparently good results. Cases of blindness, general arsenical intoxication and death soon stemmed the enthusiasm for the preparation. It is, of course, possible that the biological attraction of the bilharzia for antimony may be so great that even these relatively small quantities may effect a destructive action on the worms and ova without endangering the host. If this proves to be the case, Dr. Christopherson's work will bear abundant fruit.

THE ÆTIOLOGY OF INFLUENZA.

Notwithstanding the opportunities provided by the world-wide epidemics of influenza, it must be admitted that its causation is as much a mystery to-day as it was in the middle of 1918. In the outbreak of 1889-1891 it was held very widely that the bacillus described by Pfeiffer was the causal organism. The evidence on which this belief was based, was incomplete. On the re-appearance of the disease in 1918, it soon became quite certain that the case for the influenza bacillus had not been proved and that, while doubt existed, it was unsafe to assume either that it was or that it was not the primary cause of the infection. It seems as if bacteriologists have been too busy preparing vaccines in the hope that they might do good, to afford time to identify the causal organism of the disease. The epidemics have now practically died out in all parts of the world and it will be necessary to wait for a fresh outbreak, before the uncertainty can be removed. It is, however, wise to take stock of the facts that have been recorded during the wave-like epidemics. In June of this year, a full dress discussion on influenza took place at the Annual Meeting of the American Medical Association at Atlantic City. Among the papers contributed to this discussion, there were two to which we would direct the attention of readers. The first is by Dr. Martin J. Rosenau.¹ In this communication the author describes a series of experiments carried out by Dr. G. W. McCoy, the Director of the Hygienic Library of the United States Public Health Service, Dr. J. Goldberger, Dr. Leake and Dr. Lake, officers of the same service, Dr. J. J. Keegan, Dr. De Wayne Richey and the author, members of the United States Navy. These trained observers obtained the co-operation of about one hundred volunteers. They first endeavoured to reproduce influenza in the volunteers by applying cultures of influenza bacillus to the nose, fauces and eyes. At first small quantities were used, but later many hundred million organisms were used without a single positive result. It may be mentioned that the volunteers used for these experiments had not had any recognizable febrile attack during the preceding six months or more. They were all healthy individuals, between 18 and 25 years of age. In the next place the secretion was collected from the mouth, nose and respiratory passages of patients in the early stages of influenza and applied in liberal quantities to the mucous surfaces of the volunteers. Again the results were negative. Other attempts were made to reproduce the infection by direct implantation of the secretions from the patients to the mucous surfaces of the volunteers, while in one set of experiments 100 c.cm. of blood from patients were pooled and one tenth of the quantity was injected into each of ten volunteers. Still no influenza resulted. Lastly, ten men were brought into very intimate contact with the patients. They sat talking with them; they shook hands, allowed the patients to breathe directly into their faces and to cough at them, at short range. Not one developed influenza. Precautions were taken to select patients with undoubted influenza. They were chosen

¹ Journ. Americ. Med. Assoc., August 2, 1919.

from a group of patients who were taken ill in the course of well-defined local epidemics of characteristic type.

The second communication is by Dr. William H. Park, the Director of the Laboratories of the New York City Health Department.² He passes in review the results of systematic bacteriological investigation carried out by competent observers in different parts of the United States. From these records, he finds that, while the frequent presence of the influenza bacillus of Pfeiffer, of the different types of pneumococcus, of various streptococci and of *Micrococcus catarrhalis* has been established, the differentiation between a causal organism and secondary invaders must be based on constancy in presence, in type and in biological and morphological characteristics. The organism most constantly found was the bacillus of Pfeiffer. This organism, however, was discovered in about one half of healthy soldiers examined. Dr. Park, with Miss Valentine and Miss Cooper, made a minute study of the strains of influenza bacillus isolated from one hundred patients. These workers found that by applying the direct and absorption methods of agglutination reactions, striking differences were noted between the strains from different patients. As a rule all the bacilli cultured from the same patient, yielded the same characters. The maintenance of the biological qualities by given strains was further exemplified by the findings in a case of acute bronchitis in one of the workers and in an accidental inoculation with influenza bacillus in another. It thus appears that the influenza bacilli isolated from patients suffering from influenza during the epidemic represented not one definite type, such as would be the case if this organism were the primary cause of the infection, but many types. Dr. Park is satisfied that these experiments were accurate and that all the findings were carefully controlled. He is therefore compelled to relegate the influenza bacillus to the class of secondary invaders with the pneumococci and streptococci. He touches lightly on the question of the filter passer. In a short series of tests carried out, one very slight attack of coryza and a moderate attack resulted. He points out that there is nothing to justify the assumption that the organism differed in any way from the filter-passing organism known to be associated with ordinary catarrh. It would therefore appear that when the next wide-spread epidemic occurs, bacteriologists will have to commence *de novo*, with a clean slate. None of the organisms hitherto isolated from patients with influenza may be regarded as more than secondary invaders.

FUNCTIONAL DISORDERS OF THE HEART.

Information concerning the physiology of the cardiac muscle as revealed by modern instruments of precision, has materially assisted the physician to understand the mechanism of heart lesions and of symptoms arising from these lesions. Those who affect a sceptical attitude in regard to the progress in knowledge resulting from the conceptions of cardiac disease of Mackenzie, Einthoven, Lewis and their followers, are apt to suppress the fact that there is much that the stethoscope, the percussing and palpating

finger, the tonometer, the test-tube, the polygraph, the electro-cardiograph and the general powers of observation of the medical practitioner of to-day cannot reveal. The older method of estimating disturbances of the heart and of the vascular apparatus failed to divulge the actual changes in the physiology of these organs. The newer methods have contributed materially toward a clearer understanding of the complicated mechanism, while it would seem certain that continued investigation along the lines indicated by the modern worker will expand our knowledge in new directions. For some years a number of workers have turned their attention to the dynamic action of the heart in the hope that many hitherto inexplicable phenomena might be explained. Dr. C. J. Wiggles and Lieutenant H. D. Clough have endeavoured to compare the duration of the isometric period and the length of the systole in cases of functional cardiac disorder associated with war service with that of normal individuals.¹ The term isometric period has been given to that phase in the cardiac cycle during which the intra-ventricular pressure rises after the closure of the semilunar valves and the contraction of the ventricle. During this period the ventricular muscles are unable to shorten because no blood is expelled from the cavity. As long as the semilunar valves remain closed, the pressure rises, but on their opening, the ventricular fibres contract on the blood mass and expel it from the ventricle. When the contractile power of the ventricular muscle is impaired, the isometric period is lengthened as a result of a less rapid rise in pressure and in consequence the whole systole is lengthened. The authors have endeavoured to measure the isometric period and the systole by means of optical manometers of great delicacy and the accuracy of the readings has been enhanced by introducing a simultaneous record of the heart sounds by means of improved sound recording capsules. Their observations have led them to evolve the following explanation of the functional disorders referred to. It is known that the normal heart possesses a mechanism which brings about a shortening of the systole when the rate is accelerated. In functional disorders this compensatory mechanism is either annulled or it is not evoked until the acceleration has become marked. The authors suggest that when the heart rate reaches over 80 in the minute in a person with a functional disorder, the systole is not shortened and consequently the myocardium is exposed to prolonged contractile stress. In organic cardiac lesions, there is a similar breaking down of the compensatory mechanism, but as the rate is usually slow, especially during rest and moderate exercise, the musculature is infrequently exposed to the unusual strain. In functional disturbance the heart beat is usually rapid, even when the subject is at rest. They admit that the causes of the disturbance of the mechanism are as little understood as are the factors constituting the mechanism itself. Nor have they at present any direct explanation to offer for the habitual acceleration of the cardiac beat.

The Public Service Commissioner of Victoria is seeking applications from officers of the Public Service for a Government Medical Officer in the Department of the Chief Secretary.

² *Ibid*.

¹ *The Journal of Laboratory and Clinical Medicine*, July, 1919.

Abstracts from Current Medical Literature.

PATHOLOGY.

(107) Spinal Fluid in Typhus Fever.

A. Tupa (*C.R. Soc. Biol., Paris*, May 24, 1919) describes the cytology of the cerebro-spinal fluid obtained from patients suffering from typhus fever. His observations have been carried out upon 115 persons who experienced mild or severe attacks of typhus fever during the epidemic occurring at Marseilles in 1918. Among these patients 109 exhibited the rhachidian reaction described by Devaux. This reaction consists of an initial leucocytosis of polynuclear cells followed by an enormous preponderance of mononuclear cells containing the basiphile cytoplasm of Turk. The author regards this condition of the cerebro-spinal fluid as the most certain diagnostic feature of typhus fever. The fluid obtained by lumbar puncture is quite transparent in all the stages of typhus fever. Sometimes and especially in cases with severe nervous symptoms, it is coloured yellow. The extent of the leucocytosis in the spinal fluid is variable. During the first few days after the initial rigor the exudate consists of polynuclear cells, among which many cells with basiphile cytoplasm are noticed. As the disease advances, the polynuclear cells lessen in numbers. The neutrophile granules disappear. The nucleus becomes vacuolated. As the fever abates a few leucocytes persist. As the polynuclear cells decrease in numbers, the basiphile cells increase until they produce the characteristic feature of the rhachidian reaction. As the fever lessens, the basiphile cells become less numerous and lymphocytes make their appearance. During the first two weeks of convalescence these lymphocytes are the predominant cellular element of the cerebro-spinal fluid.

(108) Vitality of Gonococci.

D. Mezincescu and D. Holban (*C.R. Soc. Biol., Paris*, May 24, 1919) furnish some observations upon the vitality and virulence of cultures of gonococci. They note that the feeble vitality of cultures appears to be connected with the reaction of the medium. Although cultures of gonococci can be obtained upon neutral or slightly alkaline ascitic agar medium, there is abundant evidence that a feeble acid reaction gives better growth. According to the authors the optimal reaction corresponds to an acidity of 2 c.cm. of normal soda per 100 c.cm., with phenol-phthalein as indicator. Whereas cultures on neutral ascitic agar die out in several weeks, cultures on the acid medium retain their vitality many months. Again, cultures made at 37° C. can be maintained for over a year and exhibit abundant growth in the new tubes. It is necessary to keep the cultures at body temperature, as they die in a few days at room temperature or in the ice chest. The virulence of cultures on acid media is retained for many months. After

sixteen months the cultures gave rise to an acute gonococcal urethritis. During the period of sixteen months the culture had passed through sixteen passages on the acid agar medium. The author specially recommends these virulent cultures in the preparation of vaccines and antisera for the treatment of persons suffering from gonococcal infections. Acid media should always be used in preparing cultures of gonococci for therapeutic purposes.

(109) Polar Staining of Diphtheritic Bacilli.

R. Debré, R. Letulle and L. S. Sergent hold the opinion that the polar staining of *Bacillus diphtheriae*, described by Babes, constitutes an excellent diagnostic feature of these micro-organisms (*C.R. Soc. Biol., Paris*, May 31, 1919). It enables a prompt differentiation to be made between true and false diphtheritic bacilli from the pharynx. Cultures are made upon a medium composed of three parts of Loeffler's medium and one part of glucose bouillon. After 20 hours' growth at 37° C. two films are made. One film is stained by Gram's method, while the other is stained by a modification of Neisser's method. Two solutions are used, an acid solution of methylene blue in weak alcohol and an aqueous solution of vesuvium. The films are fixed by heat. They are stained by the heated solution of methylene blue, decolorized with water and rapidly counterstained with the brown solution. The true *Bacillus diphtheriae* appears as a bacillus with oval rather than round granules at the extremities. The granules are slightly greater in diameter than the body of the bacillus. They appear black on a brown bacillus. Sometimes every bacillus contains granules, more often these are present in the majority. The authors have not yet found a strain of *Bacillus diphtheriae* in which the granules are entirely absent, nor have they isolated a pseudo-bacillus in which the granules are present. In 800 examinations the authors have not found any organism that could grow on the surface of Veillon's medium which possessed these granules and no organism, in which the granules were absent, could grow in the depth of the medium. Again, all colonies containing granules caused a red colour in Costa's medium. The authors draw attention to *Bacillus cutis commune*, which possesses polar granules, but also ferments sucrose. This microbe occurs on the skin and conjunctiva, but not in the pharynx.

(110) Hypertrophied Heart of Aviators.

G. Étienne and Lamy have studied the cardiac hypertrophy in a group of young aviators (*C.R. Soc. Biol., Paris*, June 14, 1919). The hypertrophy of the heart is only of moderate degree, so that it might pass unnoticed in a single individual. In a series the existence of hypertrophy can be readily recognized. The heart is more enlarged in those flying habitually at an altitude of 6,000 metres than in those flying at 3,000 metres. The hypertrophy is still less

in those flying at heights of 1,000 metres to 3,000 metres. In aviators the upper line of precordial dullness is more raised. With the radiographic screen the upper line of the cardiac shadow is more convex than in the normal person. The shadow of the apex is more rounded in the aviator. The apex usually lies in the sixth interspace; it is often deviated as far as the mamillary line. The hypertrophy can be recognized after a period of five months. It increases during the next three months. It is still present after the aviator has ceased flying for six months. The longitudinal and transverse diameters are lengthened. These alterations are not very considerable, but can be detected if attention is paid to the height and weight of the individual. In about one half of the aviators the transverse diameter is greater than the maximum found in normal persons of the same stature. The authors regard the hypertrophy as compensatory to the rarefaction of the atmosphere and to the low temperature of the air.

(111) Mutation Among Pneumococci.

M. C. Clough (*Journ. Exper. Medicine*, August, 1919) has made a routine study of the pneumococci isolated from patients with lobar pneumonia and other infective diseases in the wards of Johns Hopkins Hospital during the last four years. In addition to the usual types of pneumococci, certain strains have been isolated which agglutinate equally well with sera prepared against types I., II. and III.. Nine strains have been examined. Seven of these have been obtained from fatal or serious infections. Morphologically these organisms are typical pneumococci, growing in a characteristic manner upon ordinary media. Most of the strains dissolve in bile, ferment inulin and give rise to no precipitation upon glucose ascitic agar. The virulence has varied greatly; some cultures are practically without pathogenic action, while others kill mice in 24 hours in doses of 0.000001 c.cm. of a broth culture. A mutation occurred in one of the strains during the period of observation. On isolation this strain had the phagocytic and serological reactions of an atypical type II.. After 6 months cultivation its serological reactions became similar to those mentioned above. Its cultural characters altered. It became insoluble in bile, did not ferment inulin and precipitated glucose ascitic agar. It produced an intense green colour at the base of blood agar slant tubes. By repeated passages through animals this strain was three times made to revert to its original form in cultural and serological characters. An immune serum was prepared to each variety of the strain and each serum acted on the homologous form, but was without action on the heterologous form of the strain.

PÆDIATRICS.

(112) Appendicitis in Children.

Diagnosis in children is frequently more difficult than in adults, mainly

because of the difficulty of obtaining a reliable history. Physical examination is in some respects easier than in adults; the field is small and the probabilities fewer. The reaction of normal tissues to carefully exerted pressure is the only real guide in diagnosis. To elicit this, however, extreme patience and gentleness are absolutely essential. Palpation in a warm bath may even be necessary with extremely nervous children. Farr (*Arch. of Pediatrics*, April, 1919) considers that the frequency of appendicitis in children is much underestimated. In some the condition is not recognized, even when they die. Others recover, to fall into the class of chronic appendicitis in adult years. A pathologically altered appendix in an infant under one year is rare, but it is not uncommon to find decided changes in the appendix of older children, who have apparently had no previous attacks. From this it may be deduced, either that there were no acute attacks, or that they were not diagnosed. It is far more probable that there were acute attacks of a mild nature, called "bilious attacks," constipation, "worms," teething, indigestion, etc., corresponding to the mild or moderately severe attacks in adults now commonly recognized and cured by operation. The mortality in childhood is considerably greater than that in adults, probably because the lymphoid tissues of the appendix are more liable to acute infection than the tougher adult tissues. Various hospital mortality tables show that the average known period of duration of the disease in children on admission is over four days, as compared with the 48-hour period of many acute adult cases. This delay in diagnosis and in operation depends probably on the refusal of the parents to recognize the condition as a serious one. Failure to make a rectal examination is the most common fault on the part of the practitioner. The author concludes that (1) appendicitis in children is probably much more common than is generally recognized; (2) the reason for the apparently higher mortality in children is that, in general, only in the more serious cases is an operation carried out; (3) the progress of the disease is little, if any, more rapid in children than in adults; (4) earlier diagnosis and operation in milder cases would probably halve the mortality, as it has in adults.

(113) Malnutrition in Children.

With the view to the determination of the percentage of poorly nourished children and the causes of their malnutrition, Gordon and Bartley (*Arch. of Pediatrics*, May, 1919) examined 900 children between the ages of one month to seven years admitted to a seaside home for a week. Their conclusions are as follows: (1) In the examination of the 900 children for nutrition, as shown by appearance, weight and height, it was found that the weight to height basis was the most reliable standard of judging nutrition. Next in value was the weight to age relationship and then the general appearance. The higher rate of malnutrition, as

compared with other published records for children in large cities, was probably due to the fact that the children in their series were practically all referred to the home owing to their home surroundings and their physical condition. The classification of the poorly nourished, by being divided into the absolutely and the relatively poorly nourished, lessened considerably the incidence of those requiring urgent medical care and treatment. (2) The most critical period in a child's early life is between the ages of two and six years. (3) The chief causative factors of malnutrition in the series were environment and disease, the latter being considered from the view-point of previous history and condition at the time of examination. A previous attack of measles, pertussis or pneumonia were found to have a deleterious effect, in the order named, on the subsequent life of the child. Scarlet fever, diphtheria and other contagious diseases apparently had little effect on the general health after recovery. Conditions present at the time of examination, which could be considered as causes of malnutrition, were adenoid vegetations and hypertrophied tonsils, defective teeth, gastro-enteritis and heart lesions, in the order named. Nationality had some effect on nutrition. (4) The degree of nutrition present in a child should not be judged by one standard alone, but by a comparison of two or more.

(114) Dental Infections in Children.

With a view to determining the bacteriology of dental infections in children Smith (*Arch. of Pediatrics*, March, 1919) made a special study of 109 cases of periodontal infections, including 4 of secondary fistula, 8 of gingival abscess, one of abscess in the roof of the mouth and one of an infected maxillary gland, all occurring in children from 2½ to 11 years. The author points out the importance of the regulation of oral foci to metastatic infections of the heart, kidneys, blood-vessels, joints and other tissues. Of the organisms found in these infected areas, there are none having the varied possibilities for disease production as the streptococcus group. It is generally recognized that bacterial invasion is characteristic of the pus stage and is not necessarily present in all inflammatory conditions without pus at the root of a tooth. The exact path of the infection by blood stream or by lymphatic invasion, is uncertain. The constitutional condition must also be taken into account, whether due to inherited or acquired disease or to malnutrition or unhygienic surroundings. The chief organisms found in the series of 109 cases were *Streptococcus hemolyticus* 27, *Streptococcus pyogenes* 19, *Staphylococcus pyogenes aureus* 37, *Diplococcus pneumoniae* 18. All streptococci were injected into rabbits and of these 48 cases, 11 showed metastatic infection. The author considers that on account of the time-consuming difficulty in handling children, the teeth of these little patients are too often neglected by the parent, dentist and medical attendant. Too much attention is paid to

the tonsil alone and too little to the often primary focus round the teeth. Children's teeth infected as these were, must be extracted, if the focus cannot otherwise be sterilized, a thing rarely accomplished. Though many dentists are of the opinion that premature extraction of the deciduous teeth may result in the retardation of the development of the dental arch and be the indirect cause of malocclusion of the permanent teeth, these infected areas should be eradicated. While extractions may be one of the causes of malocclusion, this is a lesser evil than the constant absorption of infected material from the periodontal area, which may be the aetiological factor in embolic diseases of other organs of the body, as has been shown experimentally. Teeth must not be considered as an organ apart from the rest of the body, for only by considering the whole system can permanent results be obtained. When this is thoroughly done, dental infections, their causes and results, can be successfully treated in children.

(115) Vaccine Therapy in Whooping Cough.

During the last eight years numerous investigators have been testing the value of vaccines in whooping cough. Bloom (*Arch. of Pediatrics*, January, 1919) gives a short account of the methods and conclusions following on the use of the vaccines in varying doses given at varying intervals, and completes his article with a detailed description of numerous cases in his own practice. During the past three years, he has used both simple and combined (or mixed) vaccines in about 300 cases. Constant and quicker results were noted with the combined vaccines. Autogenous vaccines were not practicable for several reasons. The number of Bordet-Gengou bacilli and the influenza bacilli were gradually increased in the mixed vaccine, while the *Staphylococcus pyogenes aureus*, the *Streptococcus pyogenes* and the *Micrococcus catarrhalis* were not. The number of injections and the dosage and interval varied with each case. The loss of appetite and sleep and the restlessness present in the majority of cases, had no relation whatever to the vaccine therapy. No complicating pneumonia or tuberculosis occurred in the author's cases and there was no case of anaphylaxis. The mixed and concentrated fresh vaccine (1 c.c.m. = 5,000 millions) was given every other day or in critical cases every day, commencing with 1 c.c.m. and repeating the same dose or slowly increasing it to 1.5 c.c.m. No medical treatment is indicated. The dangers are nil. The author's conclusions are that: (1) vaccine therapy in pertussis is rational and effective; (2) experience has proved its efficiency, both as a prophylactic and as an active therapeutic agent; (3) its use minimizes the loss in weight, reduces the duration of the disease, decreases the intensity of the illness, diminishes the possibility of complications and sequelae, is unattended by danger of anaphylaxis and limits the mortality.

British Medical Association News.

SCIENTIFIC.

The members of the New South Wales Branch assembled at the Orthopaedic Department of the No. 4 Australian General Hospital, Randwick, at the invitation of the Medical Officer Commanding, Lieutenant-Colonel C. S. L. Macintosh, D.S.O., on the afternoon of September 12, 1919.

There was a very large attendance of members and the excellent manner in which the demonstrations and inspections had been prepared, rendered the afternoon a very valuable and instructive one.

A visit was paid to the Medical Gymnasium, where Captain N. D. Royle gave a demonstration of exercises and the use of apparatus. He explained briefly the objective of the treatment employed. The members then passed on to the Massage Rooms, where a considerable number of patients were under treatment. In this Department there is a small collection of selected Zander apparatus. Lieutenant-Colonel R. B. Wade, Consulting Orthopaedic Specialist of the Australian Army Medical Corps in Australia, described the uses of these appliances and emphasized the point that the therapeutic effect was obtained in all cases by the active exercise of the patient's own muscle. From the Massage Rooms the members passed on to the Electrical Rooms, where several patients were being treated by electricity applied by means of the Bristow coil and other methods. Captain G. R. P. Hall undertook the demonstration of the apparatus in use and placed himself at the disposal of members who sought information from him. In the Bath Rooms there was less to see, but Major D. J. Glissan gave demonstrations of the whirlpool baths and other bathing appliances employed in the treatment of orthopaedic affections. Lieutenant-Colonel H. R. G. Poate described the methods adopted in the Record Rooms.

A great deal of interest was evinced by the members in the equipment of, and work carried out in, the Curative Workshops. Major W. Vickers explained that the activity of the patients was prescribed as treatment in every case and that vocational training did not enter into their lives at this stage. The men were required to perform tasks in the painting room, in the carpenters' shop, in the boot-makers' shop, in the foundry and in the artificial limb section, according to the need for the re-education of special muscles or groups of muscles. In many cases the treatment was prescribed for its psychological as much as for its physical effect on the patients. The results of the work were seen to be of a practical kind. The members cross-questioned the patients as to their disabilities and progress and learned that in the majority of cases the value of occupational treatment was obvious both to the patients and to the surgeon. In another room Lieutenant-Colonel R. Gordon Craig gave a highly interesting lecture-demonstration on the construction of artificial limbs, their adaption to stumps and their uses. He dealt in considerable detail with the work of the Commonwealth Artificial Limb Factory, at which "Aunger" legs are made. The demonstrations included the parading of men with one or both legs amputated above and below the knee. He showed in the most practical manner that amputation below the knee, even if double, did not lead to a very serious disability, provided that the patient learned to use his prosthesis to the best advantage. He also presented a man who had attained great skill in the use of the Carne arm. The power of grasping with the artificial hand is derived from the shoulder.

Captain L. G. Teece found some difficulty in his demonstration of surgical appliances, owing to the limited space at his disposal and the large number of members who were anxious to see and learn. His demonstration dealt with the various uses of the "cock-up" splint in overcoming the spasticity of the extensors of the hand, paralysis of the various muscles of the forearm and hand, and the like. He also showed patients with Verrall's splint, with splints for flexing the knee and the elbow and with extension splints.

At the termination of the visits to the various departments, the members were asked to return to the Gymnasium, where a platform and seats had been arranged during the interval. Lieutenant-Colonel R. Gordon Craig presented a patient in

whom he had grafted bridges of rib into a cranial defect. He also showed a man who had sustained a gun-shot wound of the hand and in whom he had carried out injections of alcohol into the median and radial nerves, to allay the pain in the scar resulting from the wound. Lieutenant-Colonel Gordon Craig demonstrated in the last place the disability following an injury to the posterior crucial ligament of the knee joint.

Lieutenant-Colonel H. R. G. Poate exhibited a series of skiagrams, illustrating the effect of bone grafting to cover defects in the humerus, radius and ulna. He also presented three patients with traumatic detachment of the crucial ligaments of the knee joint. In one case the injury had led to a typical and extensive derangement of the joint.

Captain N. D. Royle demonstrated the early results of an operation for the union of divided flexor tendons of the fingers. There was excellent restoration of movement. His second patient had had an ankylosed elbow joint and had been treated by arthrolysis and transplantation of tendons. He also showed a man in whom he had carried out secondary suture of the anterior tibial nerve with successful result.

Captain G. R. P. Hall demonstrated an unusual condition of paralysis of the scapular muscles following acute pneumonia.

Captain L. G. Teece showed two patients in whom he had undertaken secondary suture of divided nerves. In both there was a distinct restoration of function. In the first instance, the external popliteal nerve had been divided in the popliteal space and in the second the sciatic nerve had been divided at the level of the lower border of the gluteus maximus. He also showed two patients who had had traumatic adhesions of the knee joint and who had been treated by free breaking down of the adhesions under an anæsthetic. The patients were induced to walk immediately after the intervention.

The undermentioned have been elected members of the New South Wales Branch:—

R. G. Banks-Smith, Esq., M.B., Ch.M., 1918 (Univ. Sydney), "Balmoral," Watson's Bay, Sydney.

C. N. Douglas, Esq., M.B., Ch.M., 1919 (Univ. Sydney), Molong.

F. A. Burns, Esq., M.B., 1919 (Univ. Sydney), Sydney Hospital.

T. E. Parker, Esq., M.B., 1910, Ch.M., 1914 (Univ. Sydney), D.P.H., 1919 (Cantab.), of Moss Vale, has been re-elected a member of the New South Wales Branch.

The undermentioned have been nominated for election as members of the New South Wales Branch:—

A. T. R. Robinson, Esq., M.B., Ch.M., 1917 (Univ. Sydney), Highfield Road, Lindfield.

H. L. Tooth, Esq., M.B., 1915 (Univ. Sydney), Savoy Flats, Hardie Street, Darlinghurst.

Hereward Leighton Kesteven, Esq., M.B., Ch.M., 1916; M.D., 1919 (Univ. Sydney), Maroubra.

W. W. Greer, Esq., M.B., Ch.B., 1904, M.D., 1906 (Univ. Edinburgh), F.R.C.S. Edin., 1914, of Southport, Queensland, has been elected a member of the Queensland Branch.

Naval and Military.

APPOINTMENTS.

The following announcements have been made in the *Commonwealth of Australia Gazette*, Nos. 108 and 109, of September 11 and 15, 1919:—

Australian Imperial Force.

Second Military District.

Captain C. Anderson, M.C. (Deputy Assistant-Director Medical Services, Australian Mounted Division), Australian Army Medical Corps, to be temporary Major. Dated 25th December, 1918.

Captain J. G. M. Beale, Australian Army Medical Corps, to be temporary Major. Dated 14th February, 1919.

Major R. McD. Bowman, Australian Army Medical Corps, to be temporary Lieutenant-Colonel, *vice* Beith. Dated 15th January, 1919.

Captain J. F. G. Fitzhardinge, M.C., Australian Army

Medical Corps, to be temporary Major. Dated 14th February, 1919.

Captain H. G. Leahy, Australian Army Medical Corps, to be temporary Major. Dated 14th February, 1919.

Captain P. J. B. Murphy, Australian Army Medical Corps, to be temporary Major. Dated 14th February, 1919.

Third Military District.

Captain E. N. Bateman, Australian Army Medical Corps, to be temporary Major. Dated 14th February, 1919.

Lieutenant-Colonel R. Fowler, O.B.E., Australian Army Medical Corps (Assistant Director Medical Services), Australian Mounted Division, to be temporary Colonel, *vice* Dixon, to Australia. Dated 23rd July, 1918.

Captain H. Sutton, Australian Army Medical Corps, to be temporary Major. Dated 14th February, 1919.

Captain F. L. Trinca, M.C. (since embarked for Australia), Australian Army Medical Corps, to be temporary Major. Dated 14th February, 1919.

Captain R. G. Woods, Australian Army Medical Corps, to be temporary Major. Dated 14th February, 1919.

Fifth Military District.

Captain B. G. Quinlan, Australian Army Medical Corps, is sentenced by General Court Martial to take rank and precedence in his unit and in the Australian Imperial Force as if his appointment as Captain bore date 3rd January, 1919.

Army Medical Corps.

To be Captain—

Honorary Captain A. J. Day, Australian Army Medical Corps Reserve. Dated 16th August, 1919.

APPOINTMENTS TERMINATED.

Second Military District.

Lieutenant-Colonel F. C. Wooster. Dated 31st August, 1919.

Major W. F. Simmons. Dated 28th August, 1919.

Major S. V. Appleyard, D.S.O. Dated 12th August, 1919.

Major A. J. Mollison. Dated 20th September, 1919.

Major R. B. North. Dated 16th August, 1919.

Major A. S. Curtin. Dated 26th August, 1919.

Major R. M. McMaster, D.S.O. Dated 7th June, 1919.

Major E. W. Ferguson. Dated 1st September, 1919.

Major E. P. Barbour. Dated 15th August, 1919.

Major A. E. Machin. Dated 29th August, 1919.

Captain C. O. Hellstrom. Dated 9th September, 1919.

Captain A. S. Cockburn. Dated 26th August, 1919.

Captain W. D. Quilty, M.C. Dated 15th August, 1919.

Captain P. Cockburn. Dated 19th August, 1919.

Captain G. M. Whish. Dated 13th August, 1919.

Captain N. H. Bridge. Dated 10th August, 1919.

Captain R. Roger. Dated 23rd July, 1919.

Third Military District.

Lieutenant-Colonel B. M. Sutherland, O.B.E. Dated 17th July, 1919.

Lieutenant-Colonel E. W. Gutteridge. Dated 20th August, 1919.

Major A. J. Brennan. Dated 21st July, 1919.

Major A. M. Davidson. Dated 26th March, 1919.

Major R. G. McPhee. Dated 15th June, 1919.

Captain (Honorary Major) A. W. Marwood. Dated 9th July, 1919.

Captain J. P. O'Brien. Dated 11th July, 1919.

Captain F. G. T. C. de Crespigny. Dated 11th August, 1919.

Captain S. C. Jamieson. Dated 3rd March, 1919.

Fourth Military District.

Lieutenant-Colonel L. O. Betts, O.B.E. Dated 19th August, 1919.

Major W. D. K. MacGillivray. Dated 28th July, 1919.

Australian Naval and Military Expeditionary Force.

APPOINTMENT.

Army Medical Corps.

To be Captain—

Captain (Honorary Major) F. McIntyre, M.C., Aus-

tralian Army Medical Corps Reserve. Dated 1st August, 1919.

Australian Military Forces.

GRANT OF HONORARY RANK.

The undermentioned, who has served in the Australian Imperial Force as commissioned officer, having the rank held by him in the Australian Imperial Force confirmed as honorary rank in the Australian Military Forces, as follows:—

Officer who, on appointment for active service outside Australia, was serving and is now serving in the Australian Military Forces:—

Fifth Military District.

To be Honorary Lieutenant-Colonel—

Honorary Major A. J. H. Saw, Australian Army Medical Corps Reserve. Dated 14th August, 1916.

Officers who, on appointment for active service outside Australia, were not serving in the Australian Military Forces:—

Third Military District.

To be Honorary Captains—

O. A. Field. Dated 1st March, 1916.

J. Warne. Dated 27th June, 1916.

Fourth Military District.

To be Honorary Majors—

W. R. C. Mainwaring. Dated 14th November, 1916.

L. A. Hayward. Dated 27th April, 1917.

First Military District.

Australian Army Medical Corps—

Captain (Honorary Major) A. V. Meehan, Second Military District, to be granted the temporary rank and pay of Lieutenant-Colonel whilst performing the duties of Officer Commanding, No. 27 Australian Auxillary Hospital, First Military District. Dated 1st August, 1919.

Australian Army Medical Corps Reserve—

Captain and Brevet-Major (Honorary Lieutenant-Colonel) J. R. M. Belth to be transferred from the Australian Army Medical Corps, Second Military District. Dated 16th August, 1919.

Second Military District.

Australian Army Medical Corps—

Captain and Brevet-Major (Honorary Lieutenant-Colonel) J. R. M. Belth to be transferred to the Australian Army Medical Corps Reserve, First Military District. Dated 16th August, 1919.

Captains H. R. Sear and F. O. Stokes, Captain (Honorary Major) K. M. Whiting, Captain G. Norrie and Captain (Honorary Major) F. C. Curtis-Elliott to be transferred to the Reserve of Officers. Dated 30th June, 1919.

Captain M. O. Hughes to relinquish the temporary rank of Major, and to be transferred to the Reserve of Officers. Dated 30th June, 1919.

Captains (provisional and temporary) F. J. Blaxland, W. C. Howle, E. C. Hall, C. W. Bruce, A. J. Bracken, P. S. Jones and F. C. Rogers to be transferred to the Reserve of Officers and to be Honorary Captains. Dated 30th June, 1919.

The resignation of Captain H. H. Schlink of his commission is accepted. Dated 4th August, 1919.

The resignations of Captains A. J. Gibson and R. O. Williams of their provisional appointments are accepted. Dated 28th August, 1919.

Australian Army Medical Corps Reserve—

Albert Arscott Pain to be Honorary Captain. Dated 1st August, 1919.

Third Military District.

Australian Army Medical Corps—

Honorary Lieutenant-Colonels A. H. Thwaites, D.S.O., and E. W. Gutteridge to be transferred from the Reserve of Officers and to be Captains (Honorary Lieutenant-Colonels). Dated 1st July, 1919, and 2nd August, 1919, respectively.

Honorary Major R. S. Whitford to be transferred from the Reserve of Officers, and to be Captain (Honorary Major). Dated 1st August, 1919.

Major D. A. Shields to be transferred to the Unattached List. Dated 1st September, 1919.

Captain (provisionally) G. Gocher to be transferred to the Australian Army Medical Corps Reserve and to be Honorary Captain. Dated 30th June, 1919.

Honorary Captain W. H. Godby to be transferred from the Reserve of Officers and to be Captain. Dated 1st July, 1919.

The resignation of Captain R. S. Callander of his provisional appointment is accepted. Dated 18th August, 1919.

Australian Army Medical Corps Reserve—

Harold Gencoult Smith to be Honorary Captain. Dated 1st July, 1919.

George Alexander Birnie and Howard Boyd Graham to be Honorary Captains. Dated 9th March, 1915, and 12th May, 1915, respectively.

Douglas John Thomas and Albert William Shugg to be Honorary Captains (temporarily). Dated 11th August, 1919.

Honorary Major R. H. Russell to be granted the temporary rank and pay of Lieutenant-Colonel whilst acting as Senior Surgeon, No. 11 Australian General Hospital. Dated 15th July, 1919.

Honorary Captain E. N. Scott to be granted the temporary rank and pay of Major whilst acting as Medical Officer to out-patients, No. 5 Australian General Hospital. Dated 27th August, 1919.

Honorary Captain K. Hiller to be Honorary Major. Dated 4th February, 1919, and be granted the temporary rank and pay of Lieutenant-Colonel whilst acting as Senior Physician, No. 16 Australian General Hospital. Dated 1st September, 1919.

Fourth Military District.

Australian Army Medical Corps—

Major (Honorary Colonel) C. T. C. De Crespigny, D.S.O., to relinquish the temporary rank of Lieutenant-Colonel, and to be transferred to the Reserve of Officers. Dated 1st July, 1919.

Captains (Honorary Majors) J. W. Browne and A. V. Benson and Captain A. F. Stokes to be transferred to the Reserve of Officers. Dated 1st July, 1919.

Captains (provisionally) H. S. Covernton and A. K. Gault to be transferred to the Reserve of Officers and to be Honorary Captains. Dated 1st July, 1919.

Honorary Major (temporary Lieutenant-Colonel) R. S. Rogers to be transferred to the Australian Army Medical Corps Reserve, and to retain the temporary rank of Lieutenant-Colonel whilst acting as Officer Commanding, No. 7 Australian General Hospital. Dated 1st September, 1919.

Honorary Captain H. M. Jay to be transferred to the Australian Army Medical Corps Reserve. Dated 1st September, 1919.

Captain (provisionally) J. H. Evans to be transferred to the Australian Army Medical Corps Reserve and to be Honorary Captain. Dated 1st August, 1919.

THE SOCIETY OF RETURNED MEDICAL OFFICERS OF NEW SOUTH WALES.

The first annual dinner of the Society of Returned Medical Officers of New South Wales will be held at the Wentworth Hotel, Sydney, on Friday, October 3, 1919, at 7 p.m. It is anticipated that the attendance will be large and members are requested to make an early application for tickets. The cost of the tickets will be approximately £1 1s.

We have been requested to ask all returned medical men who have served in the Royal Australian Navy, in the Australian Imperial Force, in the Naval and Military Expeditionary Forces or in the Imperial Forces and who are

desirous of joining the Society, to send in their names and addresses to one of the Honorary Secretaries.

The first general meeting of the Society, which will be open to all members, will be held at the termination of the dinner. The Joint Honorary Secretaries are Lieutenant-Colonel H. R. G. Poate, 225 Macquarie Street, Sydney, and Lieutenant-Colonel C. E. Wassall, D.S.O., Hunter's Hill.

Correspondence.

PROFESSIONAL COURTESY.

Sir,—Can it be that courtesy between the members of our profession has constituted itself a thing of the past?

After four years' war service I settled down in a certain suburb and immediately called upon the nearest eight practitioners. In doing so I did not ask for their help, and events have satisfied me that I was right to "paddle my own canoe."

What I did expect was ordinary courtesy; but even this was not forthcoming, for, after residence in this district for four months, my call has been returned by only one of those whom I visited.

I am a member of the B.M.A. and the only one of the nine of us who served with the A.I.F. abroad.

It is a pity that disillusionment in these matters comes so soon to the young practitioner.

Yours, etc.,

"M.C."

September 16, 1919.

THE PROPHYLACTIC VALUE OF INOCULATION AGAINST INFLUENZA.

Sir,—In *The Medical Journal of Australia* of September 6 you criticize my interpretation of the railway figures dealing with the influence of inoculation on the incidence of influenza. You state that a moment's thought will demonstrate that no deductions can be drawn from these figures at all—surely a grave indictment of my communication. You state, further, that the length of exposure of the individuals varied widely and also the care of the throats, hands and faces. This is certainly true, but there is nothing to suggest that the average duration of exposure or average care of the hands and faces would be widely different as between the uninoculated and inoculated groups and, in view of the large sizes of these groups, great variations of these respects are improbable. You criticize my correction of the size of the once inoculated group; but since all the doubly inoculated were singly inoculated during the first week, it would appear that some correction was necessary. The only question was what should the correction be. If the infectivity of the disease was of about the average intensity during the week January 24 to 29 that it was during the six weeks period January 24 to March 7, my correction would be justified. If its infectivity were greater during this week the danger of attack to the once inoculated would be increased. If it were less, this danger would be minimized. A study of the notification curve for the whole community suggested that during the week in question the infectivity of the epidemic was about the average intensity of the whole experimental period. This curve was admittedly not complete, but there was no reason to think its reliability differed greatly from week to week during the six weeks' period under review. It was therefore considered most reasonable to express the week's duration of the singly inoculated state in the 4,410 individuals as equivalent to the exposure of 735 persons (you state in error 745), for the whole experimental period, and to calculate the percentage incidence of the once inoculated on this new figure. You make a plea for thoroughness in revision of the figures if revision be at all necessary, and you bring forward an alternative method for their treatment. You suggest expressing the week before inoculation in the total 11,402 individuals in terms of uninoculated individuals extending over the experimental period of six weeks. My objection to this treatment is that the infectivity of the epidemic during that week was very small as judged by the number of attacks in the whole community and not comparable to the average infectivity of the epidemic during

the six weeks period under review. This correction would therefore probably induce rather than remove error. A further very grave objection to your treatment by thorough revision must be registered. You assume that no attacks occurred during the week preceding January 24 in the 11,402 persons at risk. This method of calculating case incidence without inquiring if any cases actually occurred during the week in question, looks to the unimaginative rather like an attempt to arrive at error. Another method of treating the figures is permissible without any assumption or revision whatever; that is to say, to lump the once and twice inoculated together into one group, the inoculated group, and compare the incidence in this group with the incidence in the not-inoculated. The incidences are in the ratio of 4:3, a 25% difference in favour of the inoculated. More can be got out of the figures than this, however, and I still think you are overcautious in attempting the discredit the highly probable results obtained in respect of the value of inoculation as between the once and twice inoculated groups. The figures collected by the Commonwealth Quarantine Department represent, as far as I am aware, the only controlled effort to determine the effect of inoculation on the incidence and case mortality, which have been published in Australia, and I venture to suggest that while a moment's thought may demonstrate that no deduction can be drawn from these figures, a more reasonably prolonged consideration of the figures, such as I have bestowed upon them, may demonstrate that double inoculation is of real value in preventing disease and single inoculation almost certainly does not increase susceptibility.

Yours, etc.,

W. J. PENFOLD.

Commonwealth Serum Laboratories,
Royal Park, Victoria,
September 17, 1919.

[In the leading article referred to, exception was taken to the utilization of statistics which needed revision and explanation. It is not safe to compare the risk of infection of a given number of persons during a period of one week with one sixth of the risk incurred by the same number of persons during a period of six weeks, even if it could be shown that the infectivity of the epidemic did not vary greatly during the whole period. The risk of infection depends on too many known and unknown factors. The experience of clinicians throughout Australia has been that the infectivity, i.e., the number of infections per day or per week in a given community increases at first, remains at a high level for a period of two or three weeks and then diminishes rapidly. In no community in Australia has the infectivity remained constant over a period of six weeks. Moreover, it is a bold assumption to estimate the infectivity of a disease like influenza from the notification returns. Influenza is notoriously difficult to define and the diagnoses are consequently unreliable. In the second place, many practitioners neglected to notify the cases under their care; others notified every febrile infection as influenza.

It is our contention that if a correction is made because the twice inoculated were for a period of one week once inoculated persons, a further correction should be made to adjust the period of exposure to infection before the inoculations were carried out. The calculations put forward are admittedly estimates; the available data do not admit of accurate computation. It is assumed that no attacks occurred among these people before January 24, because these people were used for the purpose of ascertaining the incidence rate. If such an error had not been excluded, Dr. Penfold might have been dealing with a partially immunized community. Even if adjustment in regard to part of the problem were admissible, the neglect to exclude a factor that must exercise a vitiating effect on the calculations, could not be overlooked. It was therefore assumed that the community had been carefully examined to exclude any person who had suffered from a febrile infection during the period immediately preceding January 24, 1919. Since the conditions of exposure to infection of the 11,402 persons are not fully known, we still maintain that it is impossible to determine the effect of a single or of a double inoculation on the liability to infection. Dr. Penfold's laudable enthusiasm has led him to a conclusion on insufficient data.—Ed.]

THE HOOKWORM CAMPAIGN IN QUEENSLAND.

The important work which has been carried out through the generous collaboration of the International Health Board of the Rockefeller Foundation with the Queensland Government, marks an epoch in the history of hygiene within the Commonwealth. The organization of the first phase was relatively simple, as it was necessary to demonstrate both to the responsible authority and to the community the immense advantages of a well-planned survey. Dr. W. A. Sawyer, the Director of the Campaign, is now instituting a more elaborate scheme of working and is looking into the future to a time when the Health Foundation will retire from the work. It is necessary at this stage that Australian practitioners should be trained, so that when the experts from the other side hand over the management of affairs, our own practitioners may be in a position to carry it on without loss of efficiency. Dr. Sawyer is seeking three registered medical practitioners to assist him and his colleagues and to become expert in this form of public health activity. We commend these positions to young practitioners with scientific training and ambition.

Births, Marriages and Deaths.

The charge for inserting advertisements of Births, Marriages and Deaths is 5s., which sum should be forwarded in money orders or stamps with the notice, not later than the first post on Tuesday morning, in order to ensure insertion in the current issue.

MARRIAGES.

ABBOTT-ALCOCK (by cable).—On June 21, 1919, at Holy Unity Church, Lynsdown, New Barnet, near London, England, Captain Nigel Basil Gresley Abbott, M.B., B.S. (Adelaide University), R.M.O., Sixth Field Horse, Palestine, was united in the holy bonds of matrimony to Miss Betty Drury Alcock, of Cheltenham, the Rev. Carver officiating. Captain Abbott is the youngest son of Dr. and Mrs. Abbott, of Clunes, South Australia, and left for Egypt from Adelaide, 1916, soon after graduating.

SEAR-VOSS.—On September 3, 1919, at St. Paul's Cathedral, Rockhampton, by Bishop of Rockhampton, Herbert Roy, second son of Mr. and Mrs. W. G. Sear, London, England, to Dorothy Muriel, eldest daughter of Dr. and Mrs. F. H. Vivian Voss, of Rockhampton.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

The undermentioned have been registered, under the *Medical Act, 1912 and 1915*, as duly qualified practitioners:—

William Abel James, M.R.C.S., Eng., 1906; L.R.C.P., Lond., 1906.

John Smith Purdy, M.B., C.M., 1898; M.D., 1904, Univ. Aberdeen.

Francis Henry Thornton, L.S.A., Lond., 1883.

Additional Registrations:—

Walter Watson Feather, Mast. Surg., 1919, Univ. Sydney.
Thomas Eric Parker, Mast. Surg., 1914, Univ. Sydney;
D.P.H., Camb., 1919.

QUEENSLAND.

The undermentioned have been registered, under the provisions of *The Medical Act of 1867*, as duly qualified medical practitioners:—

Carl Oscar Hellstrom, M.B., Univ. Sydney, 1915, Longreach.

Arthur John Ross, M.B., Medical College, Japan, 1918, Brisbane.

Medical Appointments.

Dr. W. Sangster (B.M.A.) having resigned, Dr. J. W. O'Brien has been appointed Health Officer for the District of Mount Gambier East, South Australia.

During the absence on leave of Dr. Melville Birks (B.M.A.) for a period of twelve months, Dr. G. H. Burnell (B.M.A.) has been appointed a Medical Referee for the County of Yancowinna, New South Wales.

Dr. G. H. Burnell (B.M.A.) has tendered his resignation as Certifying Surgeon for the County of Yancowinna.

Dr. A. A. Macfarlane has been appointed Senior Medical Officer to the Hospitals for the Insane, Victoria. The appointment dates from July 31, 1919.

Dr. L. E. S. Gellé (B.M.A.) having resigned, Dr. J. P. Kenny (B.M.A.) has been appointed Honorary Medical Officer in charge of the Venereal Diseases Clinic at the Perth Public Hospital.

During the absence of Dr. Blanchard on sick leave, Dr. G. J. Campbell (B.M.A.) has been appointed Acting Visiting Medical Officer to the Old Men's Home, Perth, and Dr. R. Mitchell (B.M.A.) Acting District Medical Officer, Perth.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xix.

University of Sydney: Professor of Medicine.

University of Melbourne: Lecturer in Pathology.

Public Service Commissioner's Office, Adelaide: Junior Medical Officer, Mental Hospital, Parkside, South Australia.

The Hookworm Campaign, Queensland: Three Medical Officers for Field Units.

British Solomon Islands Protectorate: Medical Officer to the Government.

Croydon District Hospital, North Queensland: Medical Officer.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	All Friendly Society Lodges, Institutes, Medical Dispensaries and other Contract Practice. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Australian Natives' Association. Brisbane United Friendly Society Institute. Cloncurry Hospital.
TASMANIA. (Hon. Sec., Macquarie Street, Hobart.)	Medical Officers in all State-aided Hospitals in Tasmania.

Branch.	APPOINTMENTS.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIA. (Hon. Sec., 6 Bank of New South Wales Chambers, St. George's Terrace, Perth.)	All Contract Practice Appointments in Western Australia.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Balmain United Friendly Societies' Dispensary. Canterbury United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Friendly Society Lodges at Lithgow. Friendly Society Lodges at Parramatta, Auburn and Lidcombe. Leichhardt and Petersham Dispensary. Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. Newcastle Collieries—Killingworth, Seaham Nos. 1 and 2, West Wallsend. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society..
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

- Sept. 30.—Vic. Branch, B.M.A., Election of two members to Federal Committee.
Oct. 1.—Vic. Branch, B.M.A.
Oct. 3.—Q. Branch, B.M.A.
Oct. 3.—N.S.W. Branch, B.M.A.; Annual Meeting of Delegates of Local Associations with the Council (first day).
Oct. 4.—N.S.W. Branch, B.M.A.; Annual Meeting of Delegates of Local Associations with the Council (second day).
Oct. 7.—Tas. Branch, B.M.A., Branch and Council.
Oct. 7.—N.S.W. Branch, B.M.A., Council (Quarterly).
Oct. 10.—N.S.W. Branch, B.M.A., Clinical.
Oct. 10.—Q. Branch, B.M.A., Council.
Oct. 10.—S. Aust. Branch, B.M.A., Council.
Oct. 14.—N.S.W. Branch, B.M.A., Ethics Committee.
Oct. 15.—W. Aust. Branch, B.M.A., Branch and Council.
Oct. 16.—Vic. Branch, B.M.A., Council.
Oct. 17.—Eastern Suburbs Med. Assoc. (N.S.W.).
Oct. 18.—Northern Suburbs Med. Assoc. (N.S.W.).
Oct. 21.—Tas. Branch, B.M.A., Branch and Council.

EDITORIAL NOTICES.

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